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PREFACE TO NEW EDITION.

In preparing the present edition of this work, the general arrangement has been retained, and, while numerous alterations in the text were necessitated by the progress of medicine, as few changes have been made as were compatible with the object of setting forth the Science and Art of Obstetrics in a clear and concise form. The principal changes will be found in the chapters on Anatomy and Physiology. The subject of Anæsthetics in labor has also been more fully discussed, and the articles on Antisepsis and Puerperal Septicæmia have been enlarged. Several illustrations have also been added. It is hoped that it will be found worthy of the continuance of favor which has been bestowed on former editions.

THE EDITOR.

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PREFACE TO FIRST EDITION.

The design of this book is to furnish a useful compend and Quiz-book for the student, and also, by the system of question and answer, to bring out the more important facts in Obstetrics more clearly than can be done in the method of continuous composition. On many points it is difficult to determine what is the "received doctrine," except by the mere numerical weight of authorities. The author has, therefore, attempted to maintain a judicious eclecticism, instead of undertaking the task, impracticable within the limits of the book, of recording all the various and more or less received teachings of all authors.

H. G. L.

PREFACE TO SECOND EDITION.

The author desires to return thanks for the uniform kindly criticism bestowed upon the first edition of this little work, and has endeavored by carefully revising its matter and manner to prepare it for continued usefulness. It has been made more complete by the addition of paragraphs and illustrations upon subjects before overlooked or inadequately treated, and by an index.

H. G. L.

POINTS TO REMEMBER WHEN HYOSCINE-MORPHINE-CACTIN COMPOUND

(H-M-C, ABBOTT)

IS EXHIBITED IN OBSTETRICAL PRACTICE

The obstetrician who is unfamiliar, from lack of personal experience, with this preparation, may well bear in mind these simple facts:

(1) Very nervous women (primiparæ usually) suffering from *early* "nagging" or "false" pains before the os is dilated, may receive one, *half-strength* tablet which will give from six to twelve hours' rest. Caulophyllin (gr. 1-3) will, however, often prove just as effective, and the dose may be repeated every thirty minutes to effect. When *true* labor pains come on, withhold H-M-C till the os is well dilated (unless the stage is prolonged, when treatment may be given as above) and expulsive pains begin, *then* give one half-strength tablet, repeating the dose *only where absolutely necessary* before the head descends upon the perineal floor. Only at this stage in all ordinary cases should the second tablet be given—and not then unless needed, as complete expulsion (unless forceps are used) may be delayed. Or, until user is experienced in the use of H-M-C in obstetrics, this, the final dose, may well be replaced by a few whiffs of chloroform.

(2) Where more than one full-strength or two half-strength tablets have been exhibited within six hours, it is *not desirable* to repeat H-M-C prior to the expulsion of the head *unless* the woman is suffering keenly at this, the final stage. Should this be the case, inject one half-strength tablet and, after five minutes, *push delivery.*

(3) In typical cases (multiparæ) "*one half-strength H-M-C tablet given when the os is well dilated and another as the head reaches the perineum*" will prove a safe rule to follow.

(4) H-M-C given in full doses *early* in labor (before placental circulation is lessened) affects mother and fetus. H-M-C given later acts promptly upon the mother, but very slightly on the child. "Blue babies" are not uncommon under any procedure, but if occasioned by H-M-C at all, are usually the

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result of *full* doses given too early in labor through direct action on child, or delay, all of which, with a little care, may be avoided.

(5) In women *peculiarly susceptible* to H-M-C, expulsive pains may temporarily cease after the first injection. Should they do so, two to five grains of quinine sulphate will promptly restore them. In some cases it may be given per rectum with advantage. Repeat in one-half to one hour if required.

(6) Hydrastinine hydrochloride (gr. 1-12) given with a little hot water will speedily control persistent "oozing"—should it occur—after delivery.

(7) It is well *always to see to it personally* that the child is breathing normally before giving it over to the nurse for care. Ligate and sever the cord promptly (unless delay is distinctly indicated). Slightly blue or feebly breathing infants should be slapped smartly with a wet towel, plunged alternately into hot and cold water, and should receive gr. 1-67 of cactin (in solution).

(8) The physician must remember that a certain percentage of all children are born cyanotic or with feeble heart-action. Recent statistics prove that more cyanotic and still-born infants occurred in a given number (over 1000) of deliveries when no anesthetic was administered than when scopolamine morphine was exhibited to the mother in proper dosage, and H-M-C, Abbott, gives even a better record. These statistics are based upon the work of Prof. Kroenig, director of the University Woman's Clinic of Frieberg, Germany, and his assistant, Dr. C. K. Gauss, report of which appeared in CLINICAL MEDICINE for May, 1907, and are evidenced by many thousands of kindred reports from the doctors of America. Kroenig found and reports an actual reduction of three percent in infant mortality in the first thousand cases in which scopolamine-morphine was used, also less danger of postpartum hemorrhage, together with many other advantages over that secured when no anesthetic was used.

Judiciously used, H-M-C (Abbott) is undoubtedly safer than scopolamine-morphine, or any other equally efficient anesthetic, in obstetrics. In order, however, to be always on the safe side, we urge the careful observance of the precautions given herein.

Blondes are more susceptible both to hyoscine and morphine than brunettes and, therefore, require the small dose of H-M-C always. In this class of cases, and also in patients where labor is liable to be quite tedious, it is often possible to dispense with the morphine after the first dose of H-M-C, giving only hyoscine in hypodermics of 1-200 grain each; and these tablets, likewise of *true* hyoscine, are supplied. By this means we avoid excessive morphine action upon the fetus and also avoid any over-effects upon mothers who are especially susceptible to morphine.

When the head is born and the face is *markedly cyanotic* (as it often is) do not begin to worry about the H-M-C you may have exhibited, but, as usual, suspect a *loop of the cord about the child's neck*, and if it is there, you will of course slip a finger up and loosen. *One child out of six* presents with one or more turns of the cord about the neck.

After cleansing the mouth of mucus with the hooked forefinger, slap the child sharply on the buttocks and if it does not gasp and cry dash a little cold water onto the chest and abdomen. Should this measure fail, practise artificial respiration; if this fails, the lungs of the child must be repeatedly inflated by blowing into them, artificial respiration being continued.

Always place the child upon its *right* side so as to favor closure of the foramen ovale and facilitate the passage of blood from the ascending vena cava into the right auricle.

Finally, it is possible that where full doses of H-M-C are given and the system kept under the effect of the drug for many hours, the *fetus* may be influenced by the morphine which it contains and, in exceptional instances, may be narcotized to some extent when born.

Ordinary care in establishing respiration is, of course, essential and the attendant should watch the child till the inhibitory effect of the drug upon the respiratory centers, or any other bar to normal conditions, ceases. Normal respiration, with the accompanying oxygenation of the blood which it produces speedily brings about normal conditions.

Finally, Doctor, when using H-M-C, just bring to bear the good, every-day "horse sense" you used in your obstetrical work before this agent was at your disposal.

Do not imagine that every somnolent or slightly "blue" baby presenting in your practice is due to the use of "Hyoscine-Morphine-Cactin." Cyanotic, and somnolent infants have been, and will be born in a certain proportion of cases

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whether the mother receives H-M-C or not. The still-born child will arrive dead, anesthetic or no anesthetic—but the mother will suffer needless agonies if the latter is withheld!

The child with a turn or two of the cord about its neck will present cyanosed, H-M-C or no H-M-C, and it is "up to *you*" to relieve the pressure as soon as the head is born. You undoubtedly have had such cases; you will probably meet them again *and you know what to do under the circumstances.* The procedures necessary are extremely simple and almost invariably effective. You would deride the surgeon who refused to use ether or chloroform when amputating a limb because "somewhere, at some time, a man died under an anesthetic." How, then, can you refuse to mitigate the pains of labor by the use of H-M-C (Abbott)—which has been proven safe in thousands of cases—because of the *possible* birth of a "blue baby," (as likely due to other causes as to H-M-C) which can be revived promptly and especially so when, with usual care and the exercise of ordinary therapeutic precaution it rarely, if ever, need occur from this cause alone. Doctor, don't listen to carping, purposeful critics, who have their interests and not your welfare at heart. If you have been in error yourself, if from faulty technic you have had trouble, get right, use common sense and H-M-C in proper proportion, meeting the few emergencies which will always arise in obstetrical practice with the skill and courage the accoucheur must always display and ***success*** is yours.

Chicago, Ill. Dr. W. C. Abbott.

"Would Not Handle an Obstetrical Case Without It"

It is unfortunate that so many of the medical men do not as yet realize the value of your products. In regard to H-M-C; would not handle an obstetrical case without it. In all my operative cases at St. Charles Hospital H-M-C is used. The continued use shows its satisfaction. I notice others are also using it at same place.

In minor surgical work, of which I have a great deal, I use H-M-C and find it by all means the proper and safest method in conducting such minor operations.

One cannot say too much for your H-M-C and where I can induce its use among fellow practitioners, always do so.

Aurora, Ill. A. R. Reder, M. D.

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QUESTIONS

ON

OBSTETRICS.

INTRODUCTION.

What is Obstetrics?

The science and art of affording aid to women in labor.

What is meant by science and art?

The *science* of Obstetrics embraces the definite rules of procedure founded upon a correct knowledge of the nature of Labor and its complications; the *art* consists in the skillful carrying out of these rules. The science may be taught in books and lectures; the art must be acquired by practice at the bedside.

How may the subject be divided?

1st. The Anatomy of the parts concerned in labor, viz.: the reproductive organs and their surroundings.
2d. The Physiology of these parts.
3d. Their Pathology, including all deviations from the natural course of labor.
4th. The treatment of natural and complicated labor.

What are the reproductive organs of woman?

1st. Internal, viz.: the ovaries, oviducts, uterus and vagina.
2d. External, viz.: the mons veneris; labia majora and minora; clitoris; vestibule and meatus urinarius; hymen or carunculæ myrtiformes; fourchette and perineum; and also the breasts.

Where are they situated?

With the exception of the breasts and mons veneris, they are placed within the *Pelvis*, or below it, between the thighs. The mons veneris is placed directly upon the symphysis pubis, and the breasts on the pectoralis major muscle of either side, from the 3d to the 7th rib.

THE PELVIS.

What is the Pelvis?

A bony structure, placed at the end of the vertebral column.

Why is it called the pelvis?

Because, when clothed with muscles, ligaments and fasciæ, it resembles a *basin*.

Of how many bones is the obstetrical pelvis composed?

Five: the last lumbar vertebra, sacrum, coccyx, and two ossa innominata.

What is the sacrum?

A wedge-shaped bone, apparently formed by the fusion of five vertebræ. It is curved, being concave in front.

How many articular surfaces does it present?

Six: by three it is connected with the last lumbar vertebra, above; by one on each side, with the ossa innominata, and by one below, with the coccyx.

What is the coccyx?

A small and similarly wedge-shaped bone, apparently formed by the fusion of three or four vertebral bodies. It has one articular surface above, by which it is connected with the sacrum. It tapers from that bone, and is supposed to be the remains of our ancestral tail.

What are the ossa innominata?

The haunch bones, of irregular shape, articulating internally with the sacrum behind and with each other in front. Each os innominatum is composed, originally, of three separate pieces, the *ilium*, *ischium* and *pubes*. Their point of juncture is found in a cup-shaped depression on the outside of the bone, called the *acetabulum*.

When do the several parts of the os innominatum unite?

By the twenty-fifth year.

What uses has the pelvis?

1st. To support and transmit the weight of the body.
2d. To contain and protect certain organs.
3d. To serve as a parturient tube or canal, through which the child may be definitely guided during labor.

To what parts is the weight of the body transmitted?

To the femora in the erect posture, and to the tuberosities of the ischia in the sitting posture.

How is the weight of the body transmitted to the femora?

By two beams of bone, consisting of the upper part of the sacrum and body of the ilium on either side.

What are these beams called?

The sacro-iliac beams (see Fig. 1).

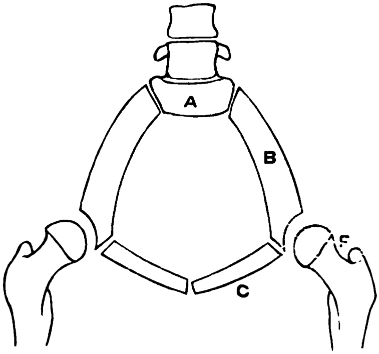
What prevents these beams from being pushed in and out at their distal ends?

Another beam is placed between them, extending from one acetabulum to the opposite one, consisting of the upper part of the pubes on either side.

What is this beam called?

The pubic beam (see Fig. 1).

FIG. 1.



B, with half of A = the left sacro-iliac beam, transmitting weight to the femur F. C = the body of pubes, constituting with its fellow the pubic beam.

Why are these beams not straight?

They are arched outwardly to make more room in the pelvis, to enable it to fulfill its second and third uses (Fig. 2).

How is the diminution in strength of the sacro-iliac beams, caused by this arching, remedied?

By buttressing the beams by that expansion of the sacrum and iliac bones, called the *wings* of the ilia and sacrum (Fig. 3).

How are jarring and concussion prevented?

By placing joints at the centre of each beam.

THE PELVIS.

What is the Pelvis?

A bony structure, placed at the end of the vertebral column.

Why is it called the pelvis?

Because, when clothed with muscles, ligaments and fasciæ, it resembles a *basin*.

Of how many bones is the obstetrical pelvis composed?

Five: the last lumbar vertebra, sacrum, coccyx, and two ossa innominata.

What is the sacrum?

A wedge-shaped bone, apparently formed by the fusion of five vertebræ. It is curved, being concave in front.

How many articular surfaces does it present?

Six: by three it is connected with the last lumbar vertebra, above; by one on each side, with the ossa innominata, and by one below, with the coccyx.

What is the coccyx?

A small and similarly wedge-shaped bone, apparently formed by the fusion of three or four vertebral bodies. It has one articular surface above, by which it is connected with the sacrum. It tapers from that bone, and is supposed to be the remains of our ancestral tail.

What are the ossa innominata?

The haunch bones, of irregular shape, articulating internally with the sacrum behind and with each other in front. Each os innominatum is composed, originally, of three separate pieces, the *ilium*, *ischium* and *pubes*. Their point of juncture is found in a cup-shaped depression on the outside of the bone, called the *acetabulum*.

When do the several parts of the os innominatum unite?

By the twenty-fifth year.

What uses has the pelvis?

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To the femora in the erect posture, and to the tuberosities of the ischia in the sitting posture.

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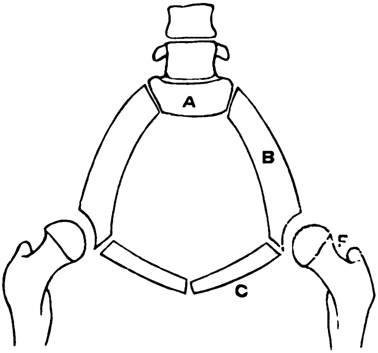

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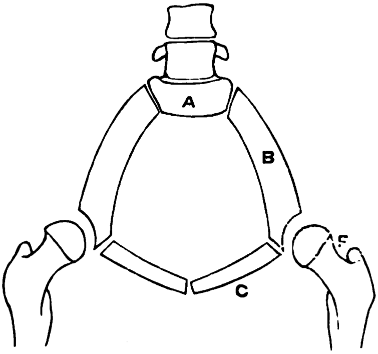

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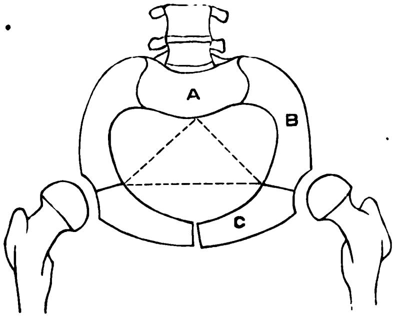
By placing joints at the centre of each beam.

How is the diminution of strength caused by these joints remedied?

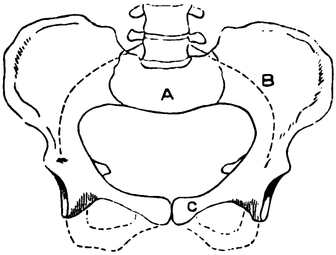
By covering them with powerful ligaments.

FIG. 2.



The same as in Fig. 1, but with the beams arched; the dotted lines show the original direction of force.

FIG. 3.



The same as in Fig. 2, with the arches strengthened by the addition of the iliac wings, etc. The dotted lines below show the sub-pubic arch in front and the beginning of the ilio-ischiatic beams.

How is weight transmitted from the vertebral column to the tuberosities of the ischia?

By two beams of bone, placed directly under the sacro-iliac beams, consisting of the ischium and under portion of the ilium on either side.

What are they called?

The ilio-ischiatic beams.

How are they held together in front?

By another arched beam, placed directly under the pubic beam, and called the *sub-pubic* beam.

What is the great sacro-sciatic notch?

The arched space under the ilio-ischiatic beam.

What bony projection is found in it?

The spine of the ischium.

What is the lesser sacro-sciatic notch?

The part of the arch below the spine of the ischium.

What is the obturator foramen?

The space between the pubic and sub-pubic beams on each side.

How is it closed?

By a membrane which gives attachment to muscles.

How may a female pelvis be distinguished from the male?

In the female, the sub-pubic beam is more roundly arched and its edges more everted; the transverse diameters are relatively greater, and the antero-posterior diameters relatively less; the transverse diameter of the inlet crosses the antero-posterior at a point in front of the intersection of the oblique diameters, and the ischial spines are to the outer side of plumb lines dropped from the posterior superior iliac spines. (Some female pelves, especially among the lower races, approach the male type.)

What joints exist in the pelvis?

Three lumbo-sacral above (one between the bodies and two between the articular processes), two sacro-iliac (one on each side), the pubic joint, in front, and the sacro-coccygeal joint, behind.

What are the pelvic joints called?

Symphyses, and the pubic joint is often called, by way of distinction, *the* symphysis.

What kind of joints are they?

Amphiarthrodial, with the exception of those formed by the articular processes of the sacrum and last lumbar vertebra, which are arthrodial, and are lined by synovial membranes. The sacro-coccygeal joint is always freely movable, and has a demonstrable synovial sac; the other joints can only be shown to have sacs during pregnancy.

What is the sacral promontory?

The projection or angle formed by the top of the sacrum in front at its junction with the vertebra above. It is often called simply the promontory.

What is the ilio-pectineal line?

A bony ridge or raised line, which, beginning at the promontory, extends around each side of the pelvis, within, until it meets the opposite line at the symphysis pubis.

What parts lie above it?

The wings of the sacrum, iliac fossæ and crests, and the last lumbar vertebra forming the bony parts of the *false pelvis.*

What lies below it?

The true or obstetric pelvis.

What is the ilio-pectineal line said to bound?

The *inlet* of the pelvis, because the child must first enter the pelvis through this bony ring. It is called also the *superior strait*, and the pelvic *brim.*

Where is the pelvic outlet?

It is bounded by the tip of the coccyx behind, by the tuberosities of the ischia on the sides, and by the sub-pubic arch in front. It is called also the *Inferior strait.*

What is the pectineal eminence?

The point in the ilio-pectineal line which is opposite the acetabulum, and is slightly raised above the ordinary level of the line.

What is the ilio-ischiatic line?

A slightly raised ridge, on the inside of the pelvis, which begins at the pectineal eminence and ends in the ischiatic spine on either side.

What are the diameters of the pelvis?

Lines drawn from various points of the pelvic cavity, to facilitate the description of the relations which the child's surface bears to the pelvis during its passage through it.

What are the diameters of the inlet?

The conjugate, two oblique, and the transverse.

What is the conjugate diameter of the inlet?

A line drawn from the promontory to the top of the symphysis pubis. It is about four inches long in the normal pelvis.

What are the oblique diameters?

Lines drawn from the sacro-iliac symphysis of either side to a point in front of the pectineal eminence of the opposite side (Meadows). The one drawn from the right sacro-iliac symphysis is called the right oblique; the one from the left symphysis, the left oblique. They are about five inches long.

What is the transverse diameter of the inlet ?

A line drawn directly across the pelvis from one pectineal eminence to the other. In the normal pelvis it is slightly longer than either of the oblique diameters.

What are the diameters of the outlet ?

The conjugate and transverse.

What is the conjugate diameter of the outlet ?

A line drawn from the tip of the coccyx to the under edge of the symphysis pubis. It is of variable length, owing to the mobility of the coccyx, but when the latter is extended, during labor, it is the longest diameter of the outlet, and may measure five inches.

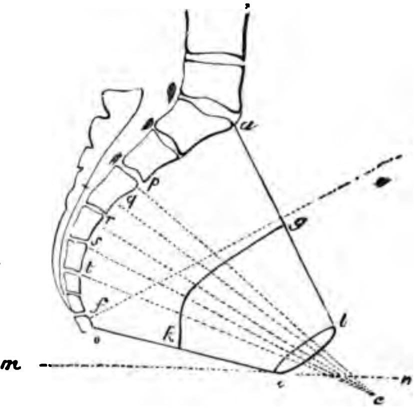
What is the transverse diameter of the outlet ?

A line drawn from one tuberosity of the ischium to the opposite one, and measures a little less than four inches in the normal pelvis.

What are the planes of the pelvis ?

Imaginary levels, drawn through any part of the pelvic circumference (Playfair), to facilitate the description of the relations of the pelvis to the child, vertebral column or horizon. They may be illustrated by pieces of card-board cut so as to fit the pelvic cavity at any level.

FIG. 4.



a b. Conjugate diameter of Inlet.
e f. Conjugate diameter of Outlet.

What planes are important ?

The plane of the inlet and of the outlet.

What is the plane of the inlet ?

A plane drawn transversely through the conjugate diameter of the inlet and limited by the circumference of the inlet.

What is the plane of the outlet?

A plane drawn transversely through the conjugate diameter of the outlet and limited by the circumference of the outlet.

How are these planes used to show the position of the pelvis in different postures?

In the erect posture the plane of the inlet makes an angle of 60° with the horizon. In the semi-recumbent posture the same plane is directly horizontal, and in the recumbent posture it forms a reversed angle of 45° with the horizon.

What is the axis of the pelvis?

As usually given it is a line drawn from the centre of the conjugate diameter of the inlet, parallel to the face of the sacrum and coccyx, to the centre of the conjugate diameter of the outlet. (The line *g k* in Fig. 4.)

How is the pelvis lined within?

By certain muscles, blood vessels, nerves and fasciæ.

What muscles are contained in it?

1. The *Psoas-iliacus* muscle on either side, consists, first, of the iliacus internus, which, in its origin, covers almost the entire inner aspect of the wing of the ilium, uniting with the psoas magnus, which passes over the upper border of the sacrum. Their conjoined body passes along the border of the sacro-iliac arch, and by a common tendon passes out of the pelvis, between the anterior inferior iliac spine and the ilio-pectineal eminence, to be inserted upon the femur.
2. The *Pyriformis* muscle on either side, which covers with its insertion the face of the sacrum, and passes out of the pelvis under the sacro-ischiatic arch, to be inserted upon the femur.
3. The *Obturator internus* muscle on either side, which covers the anterior pelvic walls and passes out under the sacro-ischiatic arch.

What obstetric uses have these muscles?

Besides serving as a soft lining to the bones, the psoas iliacus furnishes a cushion, or guard, for the iliac vessels and nerves, preserving them from pressure, while the pyriformis performs the same office for the sciatic nerve, which lies along its border.

THE REPRODUCTIVE ORGANS.

THE INTERNAL ORGANS.

What and where is the Uterus?

The uterus or womb is a hollow or muscular organ, situated in the centre of the pelvis, between the bladder and the rectum.

What are its shape and dimensions?

It resembles a pear cut in two, the anterior surface being flat, and the posterior rounded. It is three inches long, two inches broad (above) and one inch thick, and weighs in the virgin about one ounce.

Into what parts is it divided?

Into, 1st, the cervix or neck, about an inch long, and 2d, the body or fundus.

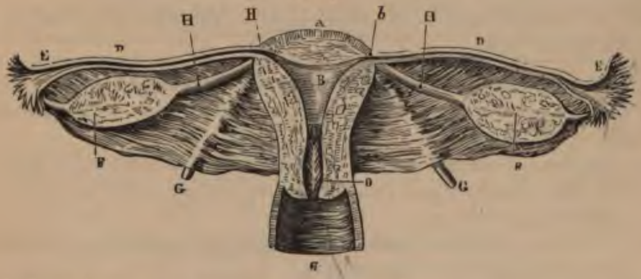
What are the cornua of the uterus?

The upper and outer angles are called the cornua.

How is the cavity of the uterus divided?

Into the cavities of the cervix and body. The first is fusiform, and appears to be an ante-chamber to the main cavity; the latter is triangular in outline, but with its walls in apposition (see Figure).

FIG. 5.



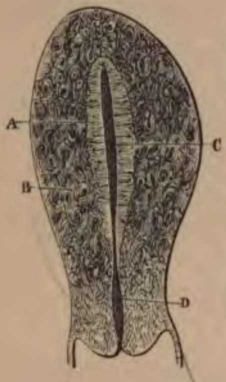
What openings are found in the cervix?

The os externum, or os uteri, called also *the* os, is a small opening into the cavity of the cervix at the lower end of the cervix. The constriction between the cavities of the neck and body is called the os internum.

What is the structure of the uterus?

It is mainly composed of muscular tissue, with fibrous connective tissue, blood vessels and nerves. On the outside, it is mainly covered with peritoneum, and on the inside, is lined with mucous membrane, called the endometrium.

FIG. 6.



How are the muscular fibres arranged ?

For the most part they are irregularly and inextricably interlaced (and surround the large blood vessels which penetrate between them), but a circular arrangement of fibres is found in the cervix, while in the body the majority are longitudinal.

What kinds of blood vessels are found in the womb ?

The arteries are mainly small, and helicine or spiral, while the veins are short, of large caliber, and freely communicating; peculiarities which warrant us in regarding the uterus as composed of a modified erectile tissue.

How is the uterus supplied with nerves ?

1st. The main nerves proceed from a well-defined nerve centre in the lumbo-sacral region (the sexual brain).
2d. The sympathetic nervous system also furnishes fibres.
3d. The vaso-motor apparatus has much influence upon the womb.
4th. Independent ganglia, like those found in the heart, are imbedded in the uterine tissue.

What kind of mucous membrane lines the uterus ?

The membrane lining the body is quite thick and vascular, and is composed—

1. Of a mesh of connective tissue containing many spindle-shaped cells.
2. Of many tubular glands, which give the surface of the membrane a perforated appearance.
8. Of ciliated cylindrical epithelium cells, which line the glands and the outer surface of the whole membrane.

The membrane lining the cervix is continuous with that of the body, and is substantially the same, except in being thrown into numerous longitudinal folds, and in containing racemose, not tubular, glands.

What distinguishing peculiarity has the uterine mucous membrane ?

It has no basement layer of connective tissue, and merges irregularly into the muscular tissue.

What kind of mucus is secreted by the uterine mucous membrane?

A viscid, alkaline mucus.

What are ovula Nabothi?

The racemose glands in the cervical mucous membrane are sometimes occluded, while the secretion continues until the gland becomes quite large and globular. They are often a source of much irritation.

How does the peritoneum cover the uterus?

It completely invests the uterus above, in front as far as the junction of the body and cervix, where the bladder touches the womb, and behind as far as the junction of the uterus and vagina.

What is the broad ligament of the uterus?

The extension of the peritoneum over the uterus causes two folds of peritoneum to be brought together at its sides, and these extend across the pelvis, to be merged into the common abdominal peritoneum. These transverse folds, enclosing muscular and fibrous tissues, blood vessels, nerves and lymphatics, are called the broad ligament, and divide the pelvis into two compartments; in the anterior one the bladder is situated, in the posterior, the rectum.

What are the round ligaments?

They are two rounded cords, composed of fibrous tissue, interspersed with muscular fibres, which extend underneath the peritoneum, from the cornua of the uterus to the top of the pelvis in front, where they pass through the inguinal canal to be inserted in the connective tissue of the labia majora.

What are the utero-sacral ligaments?

Bands of fibrous tissue which pass from either side of the uterus to the sacrum, and are of considerable strength.

What are the vesico-uterine ligaments?

Small folds of peritoneum which pass between the uterus and the bladder.

What is the normal position of the uterus?

The uterus is placed nearly in the centre of the pelvis; so that a line drawn from the top of the symphysis to the middle of the second bone of the sacrum would touch its top. Its long axis is nearly parallel to the face of the sacrum and to the posterior wall of the symphysis pubis. But it must be remembered that the uterus is movable, and 1st, rises and falls with the respiratory movements, and, 2d, is pushed backward and forward by the varying conditions of fullness in the bladder and rectum.

What supports the uterus?

1st. The uterus is swung from the sacrum by the utero-sacral ligaments.

2d. It is slightly supported or belayed by the broad, round, vesico-uterine ligaments.

3d. The walls of the vagina act as a fleshy column of support, being in turn supported by the perineum.

4th. "The retentive power of the abdomen" (Duncan), due to the existence of a partial vacuum in the abdominal cavity, aids in maintaining the uterus in its normal position.

What is a double uterus?

A uterus containing two cavities separated by a longitudinal septum. Occasionally the whole genital tract is double, the septum extending to the vulva, so that there are two vaginæ.

Sometimes a single cornu of the uterus is developed to such an extent as to be capable of containing a fœtus during gestation.

What are the Fallopian tubes?

The Fallopian tubes or oviducts are small tubes which extend from each cornu of the uterus.

What is their structure?

They are continuous in structure with the uterus, being mainly muscular, covered with peritoneum and lined with mucous membrane, which is identical with that of the uterus. The average calibre is one-sixteenth of an inch, and their length about five inches.

How do they terminate?

In an expanded or trumpet-shaped end, called the fimbriated extremity, because it is fringed with little prolongations of tubal tissue, one or more of which is adherent to the ovary of the same side.

What and where are the ovaries?

Two glandular bodies imbedded in the posterior surface of the broad ligament, one on each side of the uterus, but not covered by peritoneum. They are about the size and appearance of blanched almonds.

What is the structure of the ovary?

It is mainly composed of dense fibrous tissue, containing muscular fibres and covered by a delicate cortical layer of fibro-plastic tissue, in the meshes of which are found the ovisacs in different stages of development (see Ovulation).

What is the parovarium ?

The parovarium, or organ of Rosenmüller, consists of several tubes placed between the folds of the broad ligament. There is one on each side of the uterus. They are supposed to be the remains of the Wolffian bodies, and have no known function. They are analogous to the epididymis of the male. Very large cysts are sometimes developed from them

What is the vagina ?

A tube which serves to connect the uterus and its appendages with the outside of the body. It is attached above to the uterus and terminates below in the vulva.

How is the vagina attached to the uterus ?

It is inserted upon the outside of the womb, at the junction of the body and neck, so that the neck of the uterus projects into the tube.

What is the structure of the vagina ?

It is composed of fibrous connective tissue and of muscular fibres, for the most part circularly arranged. On the outside it becomes continuous with the ordinary cellular tissue or packing of the pelvis; within, it is lined with mucous membrane, which is reflected over the cervix uteri above, and below is continuous with the mucous membrane of the vulva.

How does the mucous membrane of the vagina differ from that of the uterus ?

It is composed simply of flat or pavement epithelial cells, and has only a few glands. Numerous depressions or crypts in the membrane answer a similar purpose and secrete a mucus of acid reaction. In the virgin it is disposed in many transverse ridges, called rugæ.

How long is the vagina ?

Its anterior wall is quite short, extending from the vulva almost directly to its point of insertion, a small pouch being formed above, called the anterior vaginal pouch. The posterior wall is longer, being prolonged upward to form a larger pouch behind the uterine neck, called the posterior vaginal or retro-uterine pouch. The average length of the vagina is from 3 to 5 inches, varying in individuals and in races.

Where is Douglas' cul de sac ?

It is situated in the abdominal cavity, directly behind the posterior vaginal pouch, and therefore between the vagina and rectum. It is a very important space, because, being the most dependent portion of the abdominal cavity, effusions of blood or other fluid and tumors of various kinds are often to be found in it.

How does the vagina terminate below?

It terminates in a circular fold of mucous membrane called the *hymen*. From the fact that this fold is often more developed in its posterior half, it usually appears as a crescentic fold, stretching across the opening of the vagina.

What is an imperforate hymen?

The membrane sometimes completely closes the opening of the vagina, and is then said to be imperforate.

What is the structure of the hymen?

It is composed almost entirely of mucous membrane, and is easily torn by the entrance of the male organ, but is sometimes firm enough to resist any ordinary pressure, and may cause delay in labor by its presence.

What are the carunculæ myrtiformes?

When the hymen is torn and greatly stretched, as by the passage of a child's head, or a large fibroid tumor, its fragments undergo atrophy, and there remain little wart-like elevations in the line of the hymen, called carunculæ myrtiformes. It is said, however, that these bodies sometimes coexist with the hymen, being placed a little distance behind it.

What is the bulb of the vagina?

A mass of erectile tissue, mainly composed of short, venous sinuses, shaped somewhat like a pair of saddle bags, and placed over and at the side of the vagina.

What are the vulvo-vaginal glands?

The vulvo-vaginal glands, or glands of Bartholin, are two small bodies situated just behind the hymen, one on each side. They are imbedded in the cellular tissue around the vagina, and empty by a small duct on either side. They secrete a thin mucus, which is expelled freely, and even by jets, during venereal excitement and coitus.

THE EXTERNAL ORGANS.

What is the vulva?

The name given to the external organs collectively, but often used to denote the genital fissure or vulval canal.

What are the labia majora?

Elevated folds of cutaneous tissue, which are found on either side of the genital fissure.

What is the structure of the labia majora?

They consist of cutaneous folds containing loosely arranged cellular tissue, with some fat. On the outer surface they are covered by a free growth of stout, curly hair, similar to that found on the axilla. On their inner surface they are furnished with a considerable number of sebaceous follicles.

What is the mons veneris?

An eminence of cutaneous tissue, the anterior termination of the labia majora, situated directly upon the symphysis pubis. It is well padded with fat and covered with an abundance of hair.

What is the anterior commissure?

The point just under the mons, where the labia meet in front. The anterior limit of the genital fissure.

What is the posterior commissure?

The posterior limit of the genital fissure, or the point where the labia meet posteriorly.

What is the fourchette?

When the genital fissure is made to gape by the fingers pulling apart the labia majora, a fold of mucous membrane is made to project behind the posterior commissure, which is called the *fourchette*. The little dimple or cup between this fold and the commissure is called the *fossa navicularis*, but neither of them have any existence until artificially produced in this manner.

What is the clitoris?

A small cylindrical body, about an inch in length, which resembles and is the analogue of the male penis. It consists of two *corpora cavernosa*, which are attached to the under edge of the pubic bone, and by their free end project slightly under the anterior commissure. The part which is visible is about the size of a pea.

What are the labia minora?

Called also the *Nymphæ*. They are two folds of dartoid tissue, covered by skin, which cover the clitoris in a manner similar to the prepuce of the penis, and extend backward along the sides of the labia majora for about one-half their extent.

What is their structure?

It nearly resembles that of the male scrotum, inclosing also some erectile tissue.

What is the vestibule?

The space which extends from the clitoris to the opening of the vagina, and is bounded laterally by the labia minora.

What and where is the meatus urinarius?

It is the opening of the urethra, and is placed at the posterior limit of the vestibule, and therefore just above the opening of the vagina. It is situated in a tubercle or slight eminence.

How long is the female urethra?

About one and one-half inches.

How is the urethra situated with respect to the vagina?

It lies directly over it, and can be distinctly recognized, by the finger introduced into the vagina, as a tubular ridge above the anterior wall of the vagina.

What is the perineum?

The space between the vulva and anus, and bounded laterally by the tuberosities of the ischia.

What is the perineal body?

It consists of a wedge-shaped band of fibrous elastic tissue, which stretches across from one tuberosity to the other, and is interposed between the termination of the vagina and rectum.

What other structures of importance are found in the perineum?

The transversus perinæi and levator ani muscles, and also fibres of the sphincter muscles, which are placed about the ends of the vagina and rectum.

PHYSIOLOGY.

OVULATION.

What is the function of the ovaries?

To furnish ova, or eggs, which are the primitive germs of the human being, and the necessary female element in reproduction.

What is the function called?

Ovulation.

How early in life does ovulation begin?

In childhood. [Sinedy and Hausmann found evidence of ovulation in 10 per cent. of infants examined by them.] But it does not occur with much vigor until womanhood.

Where are the ova found?

In small cystic bodies called ovisacs, or Graafian vesicles (or follicles), there being usually but one ovum in each ovisac.

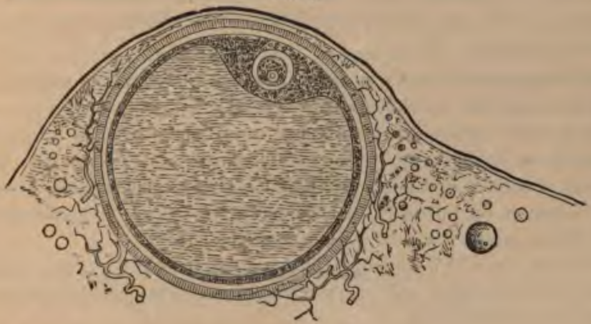
How many ovisacs exist in each ovary?

They are variously estimated from 30,000 to 650,000, but only a score or so can be observed at any one time.

Describe the ovum when fully developed.

The ovum, when fully developed, is a spherical mass of protoplasm, $\frac{1}{120}$th of an inch in diameter. It is structureless, except that it contains, at one point, a small body, like a nucleus, called the germinal vesicle, which, in turn, contains a smaller body, like a nucleolus, called the germinal spot. The ovum is surrounded by a thin envelope of albuminous matter, called the zona pellucida, or vitelline membrane, but which is not a distinct membrane until after impregnation, the ovum itself being called, also, the vitellus, or yolk.

FIG. 7.



Describe the process of ovulation.

The ovisac, at first very minute, is imbedded in the cortical layer of the ovary. Its wall consists of a layer of cells, called the membrana propria, within which is found a second layer, the membrana granulosa. An accumulation of these cells form a little mound, called the proligerous disk, and in this the ovum is situated. These cells secrete within the ovisac an albuminous fluid. While the ovisac increases in size, it also approaches the surface of the ovary, having then attained a diameter of one-fourth to one-half of an inch. At this point it *stops growing*, while the fluid continues to be secreted in its interior. This finally subjects the ovisac and the overlying covering of the ovary to a bursting pressure; the ovisac is ruptured, and the ovum, with some of the fluid and epithelium of the ovisac, is extruded upon the surface of the ovary.

What happens to the ovisac after the discharge of the ovum?

Several things may occur:—

1. The entire contents of the ovisac may be extruded, the walls collapse, and within a week or two a small linear cicatrix only is left to show that ovulation has occurred.
2. Some blood may be effused into the sac at the time of rupture. A clot is formed, which is slowly absorbed; as its hæmatin becomes faded and yellowish, it is called the *corpus luteum*.
3. Should the woman become pregnant, the walls of the ovisac may continue to secrete fluid. This is due to the increased blood supply which pregnancy occasions; and this leads to the formation of a large, yellowish body, called the *corpus luteum* of pregnancy.

How is the appearance of the ovary affected by age?

In youth it is smooth; after repeated ovulation it becomes fissured and wrinkled; in old age atrophy takes place, and it returns to nearly its infantile appearance.

What happens to the ovum after its escape from the ovisac?

1. It may drop into the abdominal cavity and perish.
2. It is wafted toward the open end of the Fallopian tube by means of a current in the fluid bathing the tissues, which current is caused by the action of ciliated epithelium cells, and is always directed toward the tube.
3. The end of the tube may, by a spasmodic movement, clasp the surface of the ovary and draw the ovum into the tube.
4. When in the tube it is passed on to the womb (*a*) by a ciliary current, and (*b*) by peristalsis, and from the womb it is discharged with the mucus, etc., unless fecundated.
5. It may become fecundated and remain within the mother until developed into a child.

How often does ovulation take place?

It is irregular in its occurrence. A number of ovisacs are constantly being developed, with greater or less rapidity, and the amount of the blood supply of the ovary controls the rate of development. Frequent coitus leads to frequent ovulation, for this reason.

What is the usual interval between the discharge of successive ova?

Usually once a month, because the greatest increase in the blood supp occurs once a month, during menstruation.

MENSTRUATION.

What is Menstruation?

A periodical disturbance in the female, characterized by

1. An increase in the vascular tension throughout the body.
2. A special determination of blood to the pelvic organs (or pelvic hyperæmia).
3. A renovation of the uterine mucous membrane.
4. A discharge of blood mixed with mucus from the uterus.

How often does menstruation occur?

Once every twenty-eight days; but the interval varies in some women, from three to six weeks.

What is the first evidence of menstruation?

An increase in the vascular tension, and a sense of fullness in the pelvic region, which may be accompanied by pain.

What effect has the pelvic hyperæmia on the ovaries?

By increasing the blood supply it hastens the development of the ovisacs, and one or more usually rupture at this time.

What effect has the pelvic hyperæmia on the uterus?

The uterus becomes larger and softer, and its mucous membrane undergoes changes as follows: 1. New cells are formed. 2. The outer layer or layers of epithelium are thrown off. 3. The membrane is turgid with blood and thrown into folds. 4. There is increased functional activity in the mucous follicles, and a more abundant secretion of mucus. 5. Some of the superficial capillaries break down, and an oozing of blood takes place.

What is the clinical course of menstruation?

1. The woman notices a leucorrhœa for one or two days.
2. A discharge of blood for three days (average).
3. A continuance of leucorrhœa for one or two days.

Is menstruation attended with pain?

Not normally, but the majority of women experience some degree of pelvic pain, because the parts are hypersensitive, from some departure from the normal condition. The pain is usually referred to the "small of the back;" also to the ovarian regions and to the hypogastrium.

What peculiarities has the menstrual blood?

1. It is mixed with blood and epithelial scales.
2. It does not coagulate when moderate in amount, because it is made acid by the vaginal mucus.

How much blood is discharged during menstruation?

From [illegible] at the normal times.

Is the blood during menstruation always discharged from the uterus?

No. The uterine mucous membrane sometimes fails to undergo its usual changes, and weakened capillaries in any part of the body may break down under the increased vascular tension. Thus we may have menstrual hemorrhage from the stomach, lungs, breasts, or any part whatever.

What is this condition called?

Vicarious menstruation, or xenomenia.

What are the popular names for menstruation?

To be unwell, to see anything, to be regular, the periods, courses, sickness, monthlies, turns, changes, and flowers.

What is the object of menstruation?

To insure the development of ova by a periodical increase in the ovarian blood supply, and to favor the retention of the ovum in the uterus by the changes in the mucous membrane.

When do women begin to menstruate?

As soon as they become women, which period is called puberty.

When does puberty begin?

It varies, from race, climate and social condition. The average is at the age of fifteen years.

What physical signs attend the age of puberty?

The reproductive organs are fully developed, the breasts enlarge, the pubes is covered with hair, and the whole form of the girl becomes rounded and womanly.

When do women cease to menstruate?

At about the age of forty-five years, which period is called the menopause or climacteric, or "the change of life."

What happens to the reproductive organs at the menopause?

They gradually atrophy, but the possibility of child-bearing may continue until the age of fifty-five years (F. Barker).

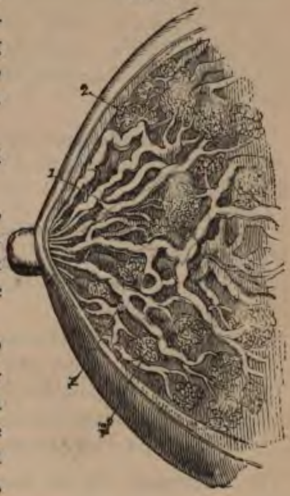
What is the main function of the uterus?

To receive the fecundated ovum, and to retain it until it is developed into a mature fetus.

What is the function of the oviducts?

To convey the ova to the uterus, and the spermatozoa to the ova.

Fig. 8.



What is the function of the vagina?

It serves as a duct or outlet for the discharge of the uterine secretions, including the escape of the child in labor, and also to admit the male organ, so that the semen may gain access to the ovum.

What is the function of the external organs?

They are endowed with great sensibility, and are mainly concerned with the function of coitus. The nymphæ also serve to direct the stream of urine as it passes from the meatus urinarius.

What is the structure of the breast?

The breast is composed of fifteen or twenty lobes of glandular tissue, with a packing of areolar and adipose tissue. The lobes are compounded of lobules produced by the aggregation of the terminal acini, in which the milk is formed. The ducts of each lobule unite with each other to form a terminal canal, called the galactophorous duct, of which there is one for each lobe (Playfair). These empty upon the face or extremity of the cylindrical appendage called the nipple.

What is the areola?

A circular patch of cutaneous tissue around the base of the nipple, of pink color in virgins, and darker in those who have borne children.

PREGNANCY.

What is Pregnancy?

The condition in which a woman contains a living and growing fœtus.

What are the essential requisites for the occurrence of pregnancy?

1. That a fully matured ovum shall be recently discharged from the ovary.
2. That male semen shall come in contact with such an ovum before it leaves the uterus.

What is fecundation?

The act by which the male semen imparts to the ovum the power of developing into a fœtus.

What part of the semen has this property?

The spermatozoa; each spermatozoōn resembles a ciliated epithelium cell, except in being apparently structureless or homogeneous. Each drop of semen contains thousands, all of which are in constant vibratile motion during life.

How long do the spermatozoa retain their vitality?

They have been found in full vigor eight days after their introduction into the vagina.

How and where is contact between the spermatozoa and ovum brought about?

1. During coitus the semen is ejected against the cervix uteri and upper part of the vagina.
2. During the orgasm of the female the uterus sucks or pumps the spermatozoa into its cavity, after which their own vibratile motion causes them to ascend the oviduct until they meet the ovum.
3. Fecundation probably occurs most frequently in the oviduct, but it can occur at any point between the ovary and the os internum uteri.

Is it necessary for the uterus to aid the entrance of the semen?

No; fecundation has occurred when the woman was perfectly passive, or unconscious, from drugs, drink, or sleep.

What further means are provided for the retention of the semen?

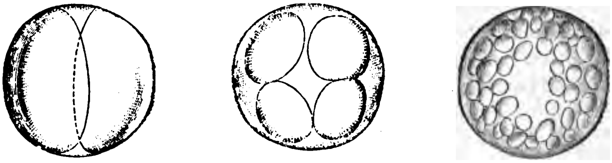
1. During venereal excitement the round ligaments of the uterus pull it forward and upward. This permits the penis to glide past the cervix and to deposit the semen in the posterior vaginal pouch. When the ligaments are relaxed, the cervix resumes its former position, and thus retains the semen in the pouch above; the spermatozoa may then, at their leisure, enter the uterus.
2. It has also been demonstrated that fecundation can take place when the semen escapes upon the vulva, so that the whole distance may be traveled by the spermatozoa unaided.

What changes take place in the ovum after fecundation?

1. The germinal spot and vesicle disappear.
2. The *segmentation* of the vitellus, *i. e.*, the vitellus splits into two masses, these into four, and so on until a large number of segments are formed. (See Fig. 9.)
3. A clear fluid is secreted within the ovum, which presses these segments to the surface of the ovum, where they form a double layer of cells, called the inner and outer *blastodermic* layers.

4. There then appears upon the outside of the vitellus a small oval elevation, surrounded by a depression, which is called the *area germinativa.*
5. There appears in the area germinativa a small, dark line, called the *primitive trace.* About this line will be grouped the various parts of the embryo, the rest of the ovum serving only as a covering and for nutriment. (See Fig. 10.)

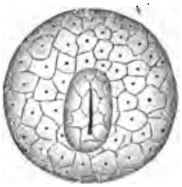
FIG. 9.



SEGMENTATION OF THE VITELLUS.

6. A covering for this trace or embryo is now formed. Thus far the vitelline membrane has been sufficient. The embryonic line sinks into the centre of the ovum, while the edges of the external blastodermic layer about the area close around it, inclosing it in a sac, called the *amnion.* (See Fig. 11.) The vitelline membrane then disappears.

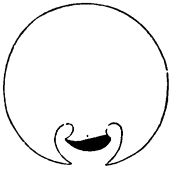
FIG. 10.



THE OUTER LAYER OF CELLS COMPLETED.

The primitive trace in the centre of the area germinativa.

FIG. 11.



SECTION OF OVUM.

Shows embryo sinking in toward the centre of the ovum, and the way in which the amnion is formed.

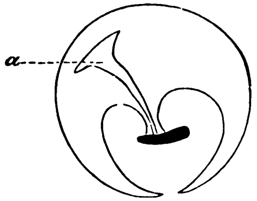
7. The rest of the external blastodermic layer, or that part which did not follow the embryo within the ovum, now forms the outer covering, and is called the *chorion.*
8. The chorion develops upon its outer surface little hollow projections, called *villi.*

6. A vascular mass, called the *allantois*, shoots out from the middle of the embryo, and when it has reached the inner surface of the ovum, spreads out, carrying loops of blood vessels into the villi of the chorion. (Figs. 12 and 13.)

10. Before the formation of the allantois, the nutriment needed for growth is furnished (*a*) by osmosis of fluids from the tissues of the mother into the ovum, and (*b*) by the fluid materials of the ovum contained within the internal blastodermic layer. While the allantois is formed, this internal layer contracts, its shrunk bulk constituting the *umbilical vesicle*, which finally disappears. (Fig. 13.)

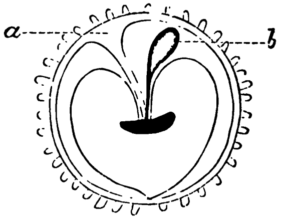
11. By the time the allantois is fully formed, if not before, the ovum has reached the womb. Its villi, thus provided with blood vessels, become enlarged and arborescent over that part of the ovum which is in contact with the uterine wall, and atrophy and disappear from the rest of its circumference.

FIG. 12.



THE AMNION NEARLY COMPLETED.
The allantois carrying blood vessels to the circumference (*a*).

FIG. 13.



THE AMNION COMPLETED.
a. The allantois completed, having carried vessels into all the projections (villi) of the chorion. *b*. The umbilical vesicle.

12. When the ovum has reached the uterus, it is detained in a fold of mucous membrane. The edges of the fold grow over the ovum, so as to give it an additional covering of mucous membrane, called the *decidua reflexa*.

13. When the ovum is thus fastened to the uterine wall, the chorionic villi increase in size, and form attachments to the uterine wall underneath it, forming the *placenta*, by which a definite vascular connection is established between the embryo and mother.

14. The placenta being formed, the embryo is suspended in the amniotic sac by a cord reaching to the placenta, called the *funis*, or umbilical

cord, and continues to develop to the end of pregnancy. It has now the following coverings: 1st, the amnion; 2d, the chorion; 3d, the decidua reflexa, besides being covered by the uterine walls in general.

What changes in the mucous membrane of the womb follow fecundation?

1. The mucous membrane of the womb becomes hyperæmic and hypertrophied; it develops new and soft connective tissue, and is thrown into folds. In this thickened state it is called the *decidua vera.* (This occurs whether the ovum enters the womb or not.)
2. When the ovum enters, adjacent folds grow over the ovum, forming the *decidua reflexa.* As the ovum increases in size, the decidua reflexa becomes united or welded with the superficial layers of the general mucous membrane, or decidua vera (about the fourth month).
3. That part of the membrane directly under the ovum undergoes greater changes, and is called the *decidua serotina.*

What is the nature of the placenta?

1. The villi of the chorion enter depressions in the decidua serotina, and bands of connective tissue unite the decidua and villi.
2. The venous sinuses under the serotina increase greatly in size, and the villi, by pressure and erosion, finally dip into them. As a result, we have a flat, cake-shaped mass, mainly composed of blood vessels, which serve to convey nutriment from the mother to the child.

Does the maternal blood enter the circulation of the child?

No. The fœtus derives nutriment by endosmosis, through the delicate walls of the villi floating in the maternal sinuses—like the rootlets of a plant—absorbing the elements needed for growth, and discharging effete products by exosmosis. According to some, the villi dip into crypts or depressions of the *decidua serotina* and not into the sinuses, and absorb a secretion called *uterine milk*, which is furnished by these crypts.

What other function has the placenta?

That of *respiration.* The fœtal blood is oxygenated in the placental tufts.

What is the funis?

The veins of the placenta ultimately unite in a single vein, which passes to the umbilicus of the fœtus. Two arteries pass from the fœtus to the placenta, and are wound spirally about the vein. These three vessels are imbedded in a substance called Wharton's gelatine, and covered by a membrane derived from the amnion. The whole is called the funis, or umbilical cord.

What are the knots in the funis ?

The fœtus in its active movements sometimes passes through a loop of the funis, and this, when drawn tight, forms a true knot. False knots are mere knobs or masses of Wharton's gelatine, formed at intervals along the cord.

What are the dimensions of the placenta and funis at full term ?

The placenta is about nine inches in diameter, and weighs one pound. The funis averages about twenty inches, the extremes being from three to forty inches in length.

Describe the fœtal circulation.

The blood is propelled from the left ventricle of the fœtus through the aorta and iliac arteries to the point where the umbilical arteries are given off; through these to the placenta, and back again through the umbilical vein, to the liver, where most of the blood passes through the portal circulation and empties by the hepatic veins into the *vena cava;* the remainder, passing through the *ductus venosus,* empties directly into the vena cava without passing through the liver. From this it enters the right auricle, and is deflected by the Eustachian valve, through the *foramen ovale,* into the left auricle, and thence into the left ventricle. The blood, returning from the head and upper extremities, passes from the right auricle to the right ventricle; to the pulmonary artery through the *ductus arteriosus,* into the aorta. It will be noticed that the venous blood of the fœtus is more oxygenated than the arterial. After birth the *foramen ovale* closes and the peculiarly fœtal vessels disappear.

What is the liquor amnii ?

A clear, slightly saline fluid, secreted from the inner surface of the amnion, and in which the embryo floats.

How much liquor amnii is found at full term ?

From half an ounce to several pints. f℥iv on an average.

How large is the ovum (and fœtus) in different months ?

By the end of the first lunar month of pregnancy the ovum is about the size of a pigeon's egg.

End of 2d month, size of a hen's egg; fœtus an inch long.
“ 3d “ “ goose “ “ 3 “
“ 4th “ the fœtus is 6.6 inches long.
“ 5th “ “ “ 7 -10½ “
“ 6th “ “ “ 11 -13 “
‘ 7th “ “ “ 13.7-15 “

End of 8th month, the fœtus is 15 –17 inches long.
" 9th " " " 16 –17½ "
" 10th " " " 17½–18½ "

[According to Schroeder.] American children are usually larger at birth.

How soon can the sex of a child be recognized?

Not certainly until *during* the fourth month.

What is vernix caseosa?

An unctuous sebaceous secretion covering the skin of the child, for the purpose of lubricating it for delivery. It does not appear until the seventh month.

What is meconium?

The dark green, semi-fluid contents of the fœtal intestine, corresponding to fecal matter in the adult. It contains granular bodies, called *meconium granules*, the presence of which is characteristic of meconium.

What changes occur in the womb itself during pregnancy?

It greatly enlarges, to accommodate the growing ovum, and at the end of pregnancy has a weight of two pounds, and its cavity is a foot in diameter. The cervix enlarges but little (not more than one-half), and its cavity remains separate until the last week or weeks of pregnancy, when the os internum is stretched open and the two cavities of the cervix and fundus become one. The tissue of the cervix becomes softer to the touch.

What changes in position does the womb undergo?

During the first month the increased weight of the uterus causes it to descend somewhat in the pelvis, or become prolapsed.

End of 2d mo.	Still low in the pelvis, and unusually anteverted. Bimanual touch shows it to be as large as a small orange.
" 3d "	The same, but as large as a child's head.
" 4th "	Fundus can be felt just above the symphysis, and being too large for the pelvis, it now ascends.
" 5th "	Fundus midway between umbilicus and symphysis.
" 6th "	" at level of umbilicus.
" 7th "	" 2 to 3½ finger breadths above umbilicus.
" 8th "	" 1 to 2 " " below ensiform appendix.
" 9th "	" touches the " "
" 10th "	" has descended to same position as in eighth month.

Why does the fundus of the uterus descend during the last month?

Because the cavity of the cervix is added to that of the fundus at that time, and the contents of the womb settle toward the pelvis, leaving more room above.

ABNORMAL PREGNANCIES.

MULTIPLE PREGNANCY.

How many children may a woman have at one time?

Two, or twins; three, or triplets; four, or quadruplets; five, or quintuplets.

How frequently do multiple births occur?

Twins, once in eighty-nine cases; the others are rare, and any over five are apocryphal.

How are multiple pregnancies caused?

1. Two or more ova may be fecundated and simultaneously developed.
2. Two primitive traces may appear on one ovum, and each develop an embryo.

These two causes may be combined in the case of triplets, etc.

How may the cause be demonstrated?

Twins developed from separate ova will each have its own placenta and membranes; from a single ovum will have a single placenta, and usually but one set of membranes, though there may be two amniotic sacs.

What is superfecundation?

The fecundation of two ova at different times, *i. e.*, with an interval of several hours, or even days.

How is this demonstrated?

By cases in which a woman has borne twins, one white, the other a mulatto, from separate intercourse with a white man and negro.

What is superfœtation?

The fecundation of a second ovum after a first ovum has entered the uterus. It may occur during the first four months of pregnancy, or before the decidua reflexa and decidua vera have become united.

How is this demonstrated?

1. By cases in which the birth of a fully-developed child has been followed by a second birth, after an interval of one, two, three, or four months.
2. By the expulsion at one birth of a fully-developed child and a fœtus evidently one or more months less advanced in development.

What is the clinical course of twin pregnancy?

1. Both children may be safely carried to term.
2. " " " prematurely expelled.
3. One twin may be prematurely expelled and the other remain until born.
4. " " die in utero and be retained until the birth of the other.

What is a fœtus papyraceus?

A twin dying in utero at an early period may be partly desiccated, and compressed by the growth of the other twin, being flattened and parchment-like in appearance.

What is a lithopædion?

A dead child may be infiltrated and encrusted by calcareous salts until it is stone-like in appearance. This occurs only after long retention in extra-uterine cysts.

EXTRA-UTERINE PREGNANCY.

What is extra-uterine pregnancy?

Pregnancy in which the fœtus is developed in some other locality than in the uterus.

How is it classified?

1. The ovum, after fecundation, may remain in the ovisac, and be developed in the ovary, called *ovarian* pregnancy.
2. The fecundated ovum may be arrested in the Fallopian tube, and be there developed, called *tubal* pregnancy.
3. It may be arrested at the junction of a tube and the uterus (the narrowest part), and developed partly in the womb and partly in the tube, called *tubo-uterine* or interstitial pregnancy.
4. It may drop from the ovary into the abdominal cavity, and be there developed, called *abdominal* pregnancy.

What effect has extra-uterine pregnancy on the womb?

It enlarges, as in normal pregnancy, up to the fifth month, and its hypertrophied mucous membrane or decidua is cast off in one piece, in several pieces or in flaky shreds, at from the second to the fifth month.

What are the symptoms of extra-uterine pregnancy?

1. The symptoms of pregnancy in general.
2. The presence of a cystic tumor in the abdomen, usually to be felt also in Douglas' cul de sac.
3. The enlargement of the womb, and
4. The displacement of the womb by the tumor.
5. Irregular, sanguineous discharges from the womb.
6. The expulsion of the enlarged uterine mucous membrane (decidua).
7. Pain, irregular in occurrence, and of intense character.

What points are especially important in diagnosis?

A rapidly growing tumor in Douglas' cul de sac, with an enlarged but *empty* womb, from which portions of decidual membrane have passed, can be nothing else than an extra-uterine cyst. The pain, if present, is characteristic. Abdominal pregnancy *may* proceed to term, without exciting any suspicions of its presence.

What is the termination of extra-uterine pregnancy?

1. Rupture of the cyst occurs in 35 per cent., followed by internal hemorrhage, shock, peritonitis, and usually death.
2. The pregnancy may continue until full term, the child dies and (*a*) the tumor is partially reabsorbed, and remains innocuous, or (*b*) inflammation supervenes, and the child is decomposed and evacuated by ulceration into the rectum, vagina, bladder, abdominal walls, or uterus—the woman running the gauntlet of peritonitis, septicæmia, pyæmia, etc.

When does the rupture of the cyst occur?

In the first half of pregnancy; seldom in second half.

What is the treatment where rupture has occurred?

If sure of the diagnosis, open the abdomen by an incision, ligate bleeding vessels, and remove all blood and fluids.

What is the general treatment of extra-uterine pregnancy?

1. If discovered in the first half of the course, arrest it by destroying the vitality of the ovum.
2. If in the second, operate as in ovariotomy, in hope of saving the child, and as near term as possible.
3. If the child is dead, await developments, and interfere only when inflammation, abscess, or other complications demand treatment.

How can it be arrested?

By the faradic current of a battery.

1. An electrode, insulated except at its tip, is to be applied to the tumor, as felt in Douglas' cul de sac, per vaginam. The other electrode is applied to the upper part of the tumor through the abdominal walls. The choice of poles (+ or —) is immaterial.
2. A moderate current is to be passed through the tumor, and gradually increased; the application to be made for an hour, and repeated every day for at least six days.
3. A large dose of morphia should be given before each application of the battery.

This treatment is certain if enough electricity is used, and for a sufficient length of time. No other treatment is either certain or safe.

What becomes of the tumor after its arrest?

It is rapidly absorbed, and becomes so small as to be inappreciable and innocuous.

What caution is necessary in operating surgically for the removal of the child?

The placenta must not be removed, because there is no contracting uterus to check hemorrhage after its detachment. It must, therefore, be allowed to remain, and become separated by the sloughing process.

HYDATID PREGNANCY.

What is hydatid pregnancy?

Pregnancy in which cystic degeneration of the chorionic villi occurs, giving rise to what is called a hydatiform mole.

1. The villi are converted into cysts.
2. The embryo dies and is absorbed.
3. The uterus is finally filled entirely with small cysts, whose average size and appearance is that of a white currant.

What are its symptoms and termination?

1. The pregnancy begins normally, but in the second or third month
2. A sudden and rapid increase in size of the uterus occurs, accompanied
3. By pain and irregular discharge of blood and water.
4. Labor supervenes and the mass of cysts is expelled.

It should be remembered that true hydatids (ecchinococci) may occur in the uterus, but not as a result or accompaniment of pregnancy.

What is hydrorrhœa?

A watery discharge from the uterus, from

1. Hydatid pregnancy.
2. A tear in the fœtal membranes, at a point remote from the os uteri, with gradual leaking of liquor amnii.
3. Probably from a watery secretion, or transudation from the uterine mucous membrane.

MOLE PREGNANCY.

What is mole pregnancy?

1. At some time during the first three months of pregnancy a hemorrhage takes place in the ovum.
2. The embryo is destroyed and disappears, while the vitality of the chorion is maintained for several weeks or months.
3. Labor supervenes, and a fleshy, laminated mass or *mole* is extruded, in

which close search will always reveal chorionic villi and patches of the fœtal membranes.

SPURIOUS PREGNANCY.

What is spurious pregnancy?

Called also *pseudocyesis*, is a condition in which some of the symptoms of pregnancy are present, especially enlargement of the abdomen, changes in the breasts, and *subjective* feeling of the fœtal movements; the woman not being pregnant. It is to be distinguished from *feigned* pregnancy.

How may it be disposed of?

A vaginal examination shows the womb to be unenlarged, and the administration of ether will cause the abdominal enlargement to suddenly disappear, when not due to increase of fat in the abdominal walls. It sometimes terminates in spurious labor, a condition in which the clinical phenomena of labor are present in some degree.

PREMATURE LABOR.

What is meant by abortion, miscarriage and premature labor?

Abortion is properly the premature expulsion of the fœtus before it is viable; premature labor, its expulsion after viability, but before full term. The older writers restricted the term abortion to the period before quickening (the child not being supposed to be living until then), and miscarriage to the period between quickening and viability. Now-a-days, miscarriage is used as a euphemism for abortion, the latter word having fallen into disrepute, and become associated with the idea of criminality.

What is meant by the term viable?

A child born after seven lunar months of pregnancy *may* live, and is called viable—liveable.

What are the causes of abortion?

$\left.\begin{array}{l}\text{Disease or injury (1) to the ovum or fœtus, } \textit{ovular,}\\ \text{Disease or injury (2) to the mother, } \textit{maternal,}\end{array}\right\}$ as

1. (*a*) Placental degeneration; amyloid or fatty (cystic, *vide* hydatids).
   (*b*) Placental apoplexy and detachment, from hemorrhage.
   (*c*) Syphilis.
   (*d*) Dropsy of amnion.
   (*e*) Violence, either accidental or intentional, rupture of the membranes, etc. The death of the fœtus from any cause is not always followed by its premature expulsion.

2. (*a*) Hyperæmia of the pelvic organs from over exercise, coitus, lifting, sewing machine, displacements of the uterus.
   (*b*) Irritation of the uterus, as from tumors, mental shock, high temperature in fevers, and
   (*c*) Emmenagogue drugs.

What are the symptoms of abortion?

1. Pain, more or less constant, felt in the back, hypogastrium or ovarian regions.
2. Uterine contractions.
3. Hemorrhage.
4. Dilatation of the os uteri, with softening of the cervix.

What are the dangers of abortion?

1. Hemorrhage; often great, because of the difficulty with which the ovum is separated from the womb.
2. Retention of the placenta, in whole or in part, with subsequent septicæmia, hemorrhage and other dangers.
3. The womb is apt to remain enlarged (see Subinvolution), and uterine disease may result.
4. Pelvic and peritoneal inflammations are more common after abortion.

When are the dangers of abortion most experienced?

In the middle third of the pregnancy. In the first three months the ovum is usually expelled entire, and the chief danger is from hemorrhage during the slow process of dilating the os uteri. In the next third, the attachments of the placenta are firmer than at any other time; the fœtus is first expelled, and the placenta often expelled with great difficulty and piecemeal, combining all the risks at their greatest. In the last three months the process differs but little from normal labor, except in being slower.

What are the chief indications for treatment?

1. To control hemorrhage.
2. To secure complete expulsion of the uterine contents.

How is hemorrhage to be managed?

1. By applying a tampon until the os is sufficiently dilated.
2. By securing complete delivery and stimulating uterine contractions.

How is retained placenta to be managed?

The placenta must be detached by the fingers, or curette, as soon as possible after the expulsion of the fœtus. If pressure is made by one hand in the hypogastric region, the womb can usually be forced down low enough to enable the finger to reach to the fundus.

What rule should guide us in difficult cases?

To persevere in efforts to remove the placenta as long as we are sure that our efforts are less injurious than allowing it to remain.

What is to be done when the placenta cannot be removed?

1. Use frequent antiseptic injections.
2. Employ remedies to guard against inflammation and septicæmia.
3. Renew the efforts to remove the placenta every day.

What preventive treatment may be used?

In threatened abortion from transient causes, absolute rest in bed, with full doses of morphine, may prevent. Quinine is also useful in malarious districts, and in general, the removal of the cause, if possible, is always indicated. If preventive measures are not promptly successful, we should endeavor to promote the speedy termination of the process.

THE SIGNS OF PREGNANCY.

What are the signs of pregnancy?

The symptoms and physical signs caused by the changes taking place in the woman, and by which we recognize the occurrence.

How may they be classified?

1. Into certain and presumptive, or
2. Into objective and subjective, or
3. According to their etiology, viz.:—

I. Signs due to the increase of vital activity.
II. " " " development of the womb.
III. " " " presence of a fœtus.
IV. " " " unequal development of the general and generative systems, or semi-pathological signs.

What are signs due to an increase of vital activity?

The pregnant condition requires that the woman shall supply, not only the needs of her own organism, as before, but shall also build up from ten to twenty pounds of highly organized tissue, viz.: the child and its envelopes. *Therefore*, she will need more blood, and in general, all the vital forces must be increased. This is brought about by the *stimulus* of fecundation, and results in (*a*) increase of appetite, (*b*) weight, (*c*) vigor, and, perhaps, (*d*) sexual appetite. She must eat more in order to make more blood; the increased blood supply will increase her weight and general vigor, while locally, the hyperæmia of the pelvic organs will cause, at first, an increase in the sexual desire.

Is this class of signs always present in pregnancy?

No. The general system may fail to respond to the stimulus of fecundation, and these signs will be absent or defective, being replaced by the fourth class.

What signs are due directly to the development of the womb?

1. The descent of the womb, due to its increased weight, causes the abdomen to become smaller and flatter during the first month or two. Hence the French proverb: "Qu'en ventre plat, enfant y'a." The umbilicus also becomes deeper, for the same reason.
2. Afterward the womb enlarges at a *particular rate*, differing from that of other tumors. (See page 35.)
3. Certain changes occur in the cervix, vagina and external organs.

What changes are found in the cervix?

It becomes *softer* and a deeper red in color. The ascent of the uterus and retraction of the vagina gives the sensation of *shortening*, though in reality it becomes longer. Some increase in the mucous secretion of its cavity is also noticed.

What changes occur in the vagina and external organs?

The increased blood supply causes the vagina to become deep red or violet in color; the external organs are somewhat enlarged, and the perineum is doubled in its antero-posterior measurement, during pregnancy.

With what other things may the pregnant womb be confounded?

The enlargement of the abdomen may be due to fibroid, ovarian, and other pelvic tumors; to ascites, flatulence, or even excessive deposits of fat in the abdominal walls or mesentery.

What changes are due indirectly to the development of the womb?

Lines from distention, a median brown line, the cessation of menstruation, contractions of the uterine walls, and certain changes in the breast.

Are these signs found only in pregnancy?

Each one of them is found to accompany other conditions, but when all or many of them are present, they furnish strong presumptive proof.

What are lines from distention?

Called also *lineæ albicantes;* are small patches of shining tissue, whiter than the surrounding skin, found on the lower part of the abdomen, especially in the iliac regions, upon the flanks, thighs, and sometimes upon the breasts. They look like small "gores" inserted in the skin, or like cicatricial tissue. Average size one inch long and one-quarter inch broad.

Are they due to distention or stretching of the skin?

Being found on the thighs, and also in young girls with rapid development of the hips, they are probably due only to rapid growth of the skin. They rarely disappear, and are, therefore, only of value in a first pregnancy.

What is the median brown line?

A narrow, brownish discoloration of the abdominal skin, extending from symphysis to ensiform appendix, in the median line, and of little value as a sign of pregnancy.

Is menstruation always suspended by pregnancy?

In the great majority of cases. Some women continue to menstruate for a month or for several months; a very few menstruate throughout pregnancy; a few cases are recorded in which the woman menstruated only when pregnant. As the decidua reflexa is not usually united to the vera for the first three months, there *may* be a menstrual hemorrhage from the womb during that time; but it is probable that any bloody discharge from the genital tract after the first month of pregnancy, is not a true menstruation, but a hemorrhage; and an indication of threatening abortion. The real reason for the cessation of menstruation is the effect which fecundation produces upon the system.

Is menstruation stopped by other things than pregnancy?

It often ceases for a few months in newly-married women, and may be stopped for one or more periods by mental emotion, change of climate, especially if following a sea voyage, acute or chronic disease, and especially by phthisis.

What is meant by contraction of the uterus during pregnancy?

The walls of the uterus are always in a state of intermittent contraction. Hence the hand of the physician placed on the abdomen of a woman may detect them (the womb becoming harder) every twenty or thirty minutes (Braxton Hicks).

What changes occur in the breasts?

1. They may become enlarged.
2. Pain or discomfort may be felt.
3. They may contain milk, which can be pressed from the nipple.
4. The nipple and areola become darker (sometimes almost black).
5. A circular ring of dark splotches may be developed at a short distance from the areola, called the secondary areola, developed after the 5th month.

6. The sebaceous follicles about the areola become enlarged, and contain sebaceous matter.
7. Lineæ albicantes may appear on them.

One or more of these changes are *always* present in pregnancy, though any of them may occur in other conditions. Their *presence*, therefore, is of less importance than their *absence*, in settling a diagnosis.

What are the signs due to the presence of a fœtus ?

1. The sounds of the fœtal heart.
2. Fœtal movements.
3. Fœtal parts found on palpation.
4. The utero-placental souffle.
5. The funic souffle, and
6. Ballottement.

What is meant by the fœtal heart sounds ?

At any time during the latter half of pregnancy the beating of the fœtal heart may be heard by placing the ear (or stethoscope) over the abdomen of the mother, being distinguished from the maternal pulsations by difference of rhythm.

What does the sound resemble ?

The ticking of a watch under the pillow, with a rate of 115-160 pulsations per minute.

Where and when are they best heard ?

They are most often heard by ausculting in the left iliac region, and may be heard from the fourth month of pregnancy, doubtfully before.

What are the fœtal movements ?

The fœtus moves about freely, and strikes out with feet and hands against the uterine wall. If the hand of the observer is placed upon the mother's abdomen, these slight blows may be felt. If not felt at once, they may sometimes be produced by wetting the hand in cold water, and applying it suddenly to the abdomen. This causes contraction of the uterus, which inconveniences the fœtus, and causes it to make demonstrations.

When can the fœtal movements be first felt ?

Not until after the fourth month, or until the uterine and abdominal walls have come in contact.

Can the fœtal movements be simulated by anything else ?

Some women have the power to contract their abdominal muscles suddenly and irregularly, so as to simulate the fœtal movements. Such instances are rare. Women often deceive themselves into feeling the fœtal movements when they are not pregnant.

What is the utero-placental souffle?

A bruit or whirring sound, which may sometimes be heard in the abdomen. It is variously supposed to be produced in the uterine sinuses, the placental circulation, the uterine or hypogastric arteries, and elsewhere. It is heard also in some fibroid tumors.

What is the funic souffle?

A similar, but less intense bruit, synchronous with the fœtal heart, and supposed to be produced in the vessels of the funis. It is rarely heard.

What is ballottement?

If, when the woman is in the erect posture, a finger (introduced into the vagina) is pushed suddenly against the anterior wall of the womb, the fœtus, if present, will first be pushed up into the liquor amnii, and will then drop back. If the finger is held in position, the return of the fœtus to its resting place may be felt and recognized. The manœuvre is called ballottement, and may be practiced between the third and fifth months, inclusive.

What is quickening?

The time at which the mother first feels the fœtal movements. The escape of the uterus from the pelvis (which is a requisite for feeling the movements) is sometimes sudden, and attended by peculiar sensations and faintness.

What are the semi-pathological signs of pregnancy?

1. When the general system fails, in whole or in part, to respond to the stimulus of fecundation, the mother's blood has a double call upon it, and is either diminished in quantity or deteriorated in quality. This leads in turn to the imperfect nutrition and impoverishment of the nerve centres, and of various organs, and as a result we may have such symptoms as:—

(*a*) Morning sickness.
(*b*) Protracted vomiting.
(*c*) Neuralgia.
(*d*) Neuroses and mental disturbances.
(*e*) Dyspepsia.

2. Ordinarily the growing womb finds a sufficient amount of room to expand in, but it sometimes, owing to natural defects, corsets, etc., exercises injurious *pressure* upon its surroundings, causing:—

(*a*) Difficulties in micturition.

(*b*) Constipation and hemorrhoids.

(*c*) Albuminuria and œdema.

(*d*) Dyspnœa.

3. From excess of natural functions we may have (*a*) plethora, (*b*) salivation, (*c*) hirsuties, (*d*) chloasma.

What is morning sickness?

Nausea and vomiting, just after rising in the morning. It is usually limited to the early months of pregnancy, or when the volume of blood is not yet increased, although there is not enough for mother and child. It is, therefore, due to the want of sufficient blood, and the consequent cerebral anæmia due to the sudden change in the circulation upon awakening from sleep and resuming the upright position.

A similar form of vomiting is sometimes met with at other times of the day, after special exertion, and especially mental effort.

How should morning sickness be treated?

It is sometimes relieved by slowness in arising, and by taking a cup of coffee before rising, and may be cured by the use of nutrients and blood-making agents.

What is the "vomiting of pregnancy?"

Continuous or protracted vomiting in pregnancy depends—

1. On the deficiency and deterioration of the blood.
2. The irritable condition of the nerve centres, due to their impoverishment from defective blood supply.
3. To an exciting cause, such as disease of the uterus, acting with the other sources.

It may be so grave as to apparently threaten life (rare), and this being well known, the quack calls every fit of nausea by this name, and cures it!

What are the indications for treatment in severe vomiting?

1. To remove any sources of irritation which may coexist with the general state of the blood.* Thus, inflammation and abrasions of the cervix uteri may exist in some cases, and their removal by proper applications may cure it.
2. To control the irritability of the nerve centres, which may be done by rectal enemas of chloral and bromide of potassium.
3. To improve the blood supply, by administering nourishing fluids in small doses, frequently repeated, beginning with milk and lime water.

In mild cases any of the anti-emetics may be used, as the oxalate of cerium, with or without the subnitrate of bismuth, etc.

What forms of neuralgia are met with in pregnancy?

Almost any form. The most common is odontalgia. Toothache is due (1) to the "cry of the nerve for healthy blood," and (2) to the fact that phosphate of lime is largely needed in the construction of the fœtus, and when not sufficiently present in the food, may be absorbed from the teeth.

What mental disturbances are met with in pregnancy?

The woman may become irritable, peevish and capricious. She may have absurd cravings for strong food (pica), or may even develop mania.

How is difficulty in urination caused?

During the first months the descent and anteversion of the uterus may cause pressure on the bladder. After the womb has ascended above the pelvis, there is rarely any difficulty until its descent, during the last week, when pressure is again caused.

How are constipation and hemorrhoids caused?

Constipation may be due to the deteriorated (hydræmic) state of the blood, but it is also due to direct pressure of the uterus upon the bowel, impairing its tonicity, or even acting mechanically. Hemorrhoids are caused in the same way.

What displacements of the womb may occur during pregnancy?

1. Early in the pregnancy the increased weight of the womb may increase the natural tendency of the womb to fall forward (*anteversion*), causing some disagreeable pressure on the bladder. This will be relieved by rest in the recumbent posture, and will soon cease.
2. When the womb is about to ascend from the pelvis, a full bladder or unusual action of the abdominal muscles may push the *fundus uteri* back and under the promontory, so as to incarcerate the womb in this position (*retroversion*). This causes great pain and retention of urine. The woman is to be placed in Sims' position, or on her hands and knees, and the womb pushed up and a little to one side, so as to clear the promontory.
3. Prolapse of the womb sometimes occurs, but generally gives no trouble after the womb is large enough to rest above the inlet.

How are the albuminuria and œdema caused?

Albuminuria may be due to the state of the blood, or to the pressure upon the kidneys or renal veins.

Bright's disease may coexist, or originate with the pregnancy. Generally the disorder is transient and terminates with delivery.

Œdema, usually limited to the lower extremities and vulva, may be consequent upon renal disease, or due to pressure upon the abdominal and pelvic venous trunks.

How is dyspnœa caused?

By pressure upon the diaphragm. It therefore appears late in pregnancy, and is usually relieved during the last weeks by the descent of the uterus.

What is meant by plethora in pregnancy?

The natural increase in the blood-making function is occasionally excessive, and too much blood is furnished, leading to attacks of vertigo and other symptoms of that condition.

What are salivation, chloasma, hirsuties?

(*a*) Salivation is an increased flow of saliva, usually found only in the latter half of pregnancy, and often accompanied by ulcerations in the mouth.

(*b*) Chloasma is an excessive deposit of pigment in the skin. Though usually confined to the mammary areolæ and the brown line, it may occur on the face, the entire abdomen and flexures of the joints, suggesting Addison's disease.

(*c*) Hirsuties is an excessive or abnormal growth of hair, usually on the face, and fortunately rare.

Which of the signs of pregnancy are certain signs?

Those due to the presence of the fœtus, and of these but one is generally available, viz.: the sound of the fœtal heart. No other sign is more than suggestive or presumptive.

Which of the presumptive signs are the most important?

The cessation of menstruation; the regular and symmetrical development of the uterus; the changes in the breasts; morning sickness, and quickening.

At what date are the important signs available?

1. The fœtal heart, rarely before the fourth month.
2. Ballottement, third to fifth month, but its failure may be due to want of skill and other causes, besides the absence of pregnancy.
3. The cessation of menstruation, usually after the time for the first period, or immediate. It is always a suspicious circumstance in *healthy* women, previously regular, whether married or not.
4. The increased size of the uterus may almost always be made out by bimanual touch, at from four to six weeks. If at a second examination, a month later, a further symmetrical enlargement, at the usual rate, is noted, the fact of pregnancy is scarcely to be doubted.

5. The changes in the breasts may begin in the second month, but are rarely marked until the middle of pregnancy, which is true of most of the presumptive signs.

What is the duration of pregnancy?

It is somewhat variable, but it is sufficiently accurate to regard it as continuing through ten menstrual periods, ten lunar months, or 280 days.

What are the limits of variation?

From 245 to 300 days, with possibilities in either direction.

What method is usually employed to calculate the duration?

Count nine calendar months forward (or three backward) from the date of the last menstruation; add to this seven days. Ex. End of menstruation, Jan. 10th; 3 months back = Oct. 10th; add 7 days = Oct. 17th, as the *probable* date of confinement.

What causes pregnancy to come to an end?

The important theories are—

1. Power's. The uterus is a peristaltic tube, with circular fibres in the cervix acting as a sphincter. As the child grows it presses upon this sphincter, and the sum of all successive irritations finally causes it to relax, and the uterus to expel the child.
2. King's. The uterus has a definite limit of growth. The fœtus does not attain its limit of growth *in utero*, and therefore distends the uterus when the latter stops growing. This irritates the uterine fibre, and causes it to contract and expel its contents.
3. The foreign body theory. The womb is always irritated into contracting upon a foreign body, and the fœtus becomes such a body at the end of pregnancy. There is probably truth in each view of the matter.

Why is the ovum not a foreign body during pregnancy?

Because of the intimate vascular connections between the chorion and the uterine mucous membrane.

How does the ovum become a foreign body?

By the fatty degeneration and atrophy of the connections between the ovum and uterus, which occurs during the last weeks of pregnancy.

What effect has this upon the uterus?

It causes a gradually increasing irritation of the muscular fibres, until contractions are excited sufficiently powerful to expel the child.

LABOR.

What is labor?

The process by which the child and its ovular attachments are expelled from the womb.

What essential steps occur in labor?

1. The enlargement of the os uteri until it is large enough to permit the passage of the child.
2. The expulsion of the child.
3. The expulsion of the placenta and membranes, also called the after-birth, or secundines.

Into how many steps is labor divided?

Into three.
I. The stage of dilatation (of the os uteri).
II. The stage of expulsion of the child.
III. The stage of expulsion of the after-birth.

By what force are these occurrences produced?

By the contraction of the uterus, aided by the abdominal muscles.

What are the contractions of the uterus called?

Labor-pains, because usually accompanied by painful sensations in the back or hypogastrium.

How long does a contraction last?

Each contraction lasts for from a few seconds to two minutes. Their duration increases with the progress of the labor, becoming longer and stronger as it advances. The average duration is a little less than one minute.

How long is the interval between them?

At the beginning of labor they are from a half hour to ten minutes apart. The interval diminishes as labor advances, and toward the end may be from five minutes to only one minute apart.

What effect have the contractions upon other muscles?

When powerful, or when the second stage is half finished, they are accompanied by contractions of the abdominal muscles, which are almost entirely involuntary, and the woman strains or "bears down." The muscles of the extremities also become rigid during the expulsive effort.

How much pain accompanies a uterine contraction?

In an entirely normal labor in a healthy woman, the pain is slight; in any case, during a bearing-down effort, the consequent cerebral fullness causes some physiological anæsthesia. But in perhaps the majority of labors there is some abnormal condition present which makes the contractions inconveniently painful.

How is the dilatation of the os effected?

1. The simultaneous contraction of all the uterine muscular fibres tends to pull apart the edges of the os, since there alone the fibres are absent.
2. The uterus is longer than broad, and its longitudinal fibres more numerous than the others; therefore, during a contraction it tends to become broader than long, which forces the contents of the uterus against the os.
3. The circular fibres about the os undergo a spontaneous dilatation, and this appears to be increased by the free secretion of mucus from the cervical glands.

What effect upon the contents of the uterus may be noticed during a contraction?

The force tends to move all the contents (child and liquor amnii) toward the os uteri; but fluids being more movable than solids, the liquor amnii is forced toward the os, while the child is driven away or recedes from it.

What is the bag of waters, and how formed?

The gradual distention of the membranes by the liquor amnii, which is forced in advance of the child, forms a bag filled with fluid, in the os uteri. This becomes tense during a pain, and relaxed during the intervals, and by its even pressure greatly aids in the dilating process.

Is the bag of waters always formed in labor, and what variations occur?

1. Sometimes the amount of liquor amnii is so small that no bag forms.
2. The membranes may rupture prematurely, and thus prevent it.
3. The membranes may be so greatly distended that the bag of waters reaches to the vulva. Usually it contains only a few ounces of fluid.

Of what service is the bag of waters after the os is fully dilated?

Of none; and the progress of the labor is suspended until the contractions are powerful enough to rupture the membranes and permit the escape of the liquor amnii.

What practical deduction follows from this?

That the physician should rupture the membranes as soon as the os is fully dilated.

How is the expulsion of the child effected?

By the contractions of the uterus, and according to a definite mechanism, depending upon the manner in which the child is placed. (See page 59 *et seq.*)

How is the after-birth expelled ?

Theoretically, the placenta becomes folded longitudinally, ground off the uterine walls by contractions and then expelled. Practically this occurrence is so uncertain that it is found best to deliver the placenta artificially.

What is the best method of delivering the placenta ?

The method of Credè, so called after its chief promulgator.

1. Place the hand upon the lower part of the abdomen and rub, stroke or knead the uterus. This will cause the womb to contract energetically, and in so doing, to ascend and move forward. Then—
2. Grasp the uterus through the abdominal walls, with one or both hands, and *squeeze* the placenta from it. If successful, the escape of the placenta may be recognized, and the latter will be found at the vulva, or even shot out into the bed. If not, wait a few minutes, and repeat both manœuvres. If the placenta is dislodged as far as the vulva, remove it, taking care to twist the membranes into a rope, by rotating the placenta, in order to avoid leaving any strips behind. *Never pull upon the funis.*

What other advantages has this method ?

It secures complete contraction of the uterus, and empties the uterine sinuses; preventing hemorrhage, inversion of the womb, uterine thrombosis, and almost all other complications.

What is the normal duration of labor ?

It is variable. Collins, in over 16,000 cases, found that 84 per cent. completed labor within six hours, or less. It is probable that in strictly normal cases three or four hours should suffice for the stage of dilatation, one hour for the second stage in first labors, and ten to thirty minutes in subsequent labors. The third stage, being artificial, is terminated at the will of the physician, and should rarely be delayed longer than ten or fifteen minutes.

Define the terms primipara, multipara, etc.

A woman in her first pregnancy and labor is called a *primipara ;* in subsequent labors a *multipara*, or if greater accuracy is required, the number may be given thus; 2 para, 3 para, etc.; one who has had one child, and is not now pregnant, is called a *unipara ;* a woman who is not a virgin, but who has never had a child, is called a *nullipara.* Adjectives are formed from these words, as, a primiparous woman, etc.

Why is labor longer in primiparæ than in multiparæ ?

Very commonly labor comes on from one to three weeks earlier in primiparæ; consequently the changes in the cervical canal are not as far advanced, and dilatation is slower than in multiparæ. During the second stage the vagina and external parts of the primipara dilate more slowly, and thus occupy a longer time.

What foundation is there for the statement that a woman who conceives late in life will have a difficult labor ?

An old primipara is apt to have, first, some inflammatory trouble of the cervix, leading to difficulty and delay in the first stage, and second, to have an unyielding sacro-coccygeal joint, delaying the second stage. Otherwise there is nothing to cause a difficult labor in these cases.

What are the ordinary duties of the physician in a case of labor ?

1. To examine the woman and ascertain the exact state of affairs.
2. To watch the progress of the case.
3. During the first stage, to encourage the woman, see that the bed is properly prepared, that due provision is made for the infant when born, and to keep others from meddling.

How should an examination be made ?

Place the subject on her back, with the knees drawn up. Anoint the index and middle fingers with fresh lard, vaseline or other unguent, and introduce into the vagina, passing the hand under the thigh until the vulva is reached. Introduce the index finger alone at first; if necessary, the middle finger may be added, which will give an additional reach of about one inch.

What should be learned from the first examination ?

1. If the woman is pregnant;
2. If she is in labor;
3. The condition of the os uteri, as to dilatation and dilatability;
4. The state of the membranes, and existence or not, of a bag of waters;
5. The presentation and position of the child;
6. The condition of the soft parts generally, as to temperature, moisture and dilatability.
7. The size of the pelvis.

The most important thing is the condition of the os.

How frequently should examinations be made ?

Often enough to keep informed as to the progress of the case. As this will vary greatly in different cases, no rule can be made. Usually, it is proper to examine every hour or half hour during the first stage. Meantime the physician need not be in the room, unless to encourage the patient; but may be in an adjoining room, or even absent himself from the house. When the second stage begins, his place is by the bedside. If progress is slow, examination may be made, as in the first stage; if rapid, the finger placed on the perineum during a pain will warn him as to the approach of the end.

How it may be known that labor has begun?

(1) By the disappearance of the cervix, (2) the dilatation of the os to some extent, (3) the presence of regular uterine contractions, (4) a discharge of mucus tinged with blood, which is called a "show." The first may fail in premature labors.

How should the bed be prepared?

An oilcloth, rubber blanket or thick comfortable should be placed upon the mattress, to keep it from being soiled by the discharges. A sheet folded several times should be placed upon this, under the woman's hips, which may be withdrawn when the labor is over, and replaced by a clean one.

When should the woman be placed in bed?

There is no special need until the os is nearly dilated, unless the labor is tedious, when her strength will be conserved by lying down and keeping quiet.

How should she be dressed?

The chemise should be tucked up, well above the hips, to prevent soiling, and therefore the need of changing it after delivery. A night-robe may be worn over this, and she should be covered with bed-clothes adapted to the temperature of the room.

What preparations should be made for the infant?

Its clothing should be made ready and aired. Several ligatures for the funis should be provided and a pair of scissors. Both hot and cold water should be in readiness.

What hygienic measures are to be carried out?

1. To see that the bowels are moved by an enema, if there has not been a recent passage.
2. To require the woman to urinate occasionally.
3. If thirsty, give her water to drink.
4. See that the room is properly ventilated.
5. If there is any deviation from the normal course of labor, ascertain and remove it by appropriate treatment.

What things are to be prevented?

Crowding the room by unnecessary company. Meddlesome practices of old women, such as giving "teas," and in general anything which will disturb the woman, mentally or physically.

What objections to giving anæsthetics to make the labor painless are urged by those who oppose this practice?

1. The pain is not great, unless some abnormal condition is present, which should be sought for and treated.
2. Natural labor lasts but a short time.
3. Anæsthetics protract the labor.
4. They increase the risk of hemorrhage (post-partum).
5. From the same cause (imperfect contraction of the womb) they increase the liability to all the puerperal diseases.
6. They endanger the child's life (especially chloroform).

How are these objections met by the advocates of obstetric anæsthesia?

1. The proper administration of an anæsthetic during labor renders the act painless, and prevents the exhaustion which may follow the protracted suffering, often severe.
2. It is not proved that, when properly administered, they protract the labor, or increase the risk of hemorrhage, and even granting the latter objection, this risk can be overcome by careful management of the third stage of labor and the use of ergot.
3. If rightly administered in suitable cases, the danger to the mother and the child is not increased.

When may an anæsthetic be used in normal labor?

During the second stage of labor, when the pain is severe, as when the head is passing through the os uteri or vulval orifice, provided no condition exists which would be considered a contraindication to etherization for surgical purposes, and provided the uterine contractions are of normal intensity.

How should an anæsthetic be given?

As the object in view is to deaden the pain, not to produce unconsciousness, the ether or chloroform should be given in small quantities, inhaled only during the pains and withdrawn in the intervals between them.

What anæsthetic is to be preferred?

1. Chloroform is most generally used, because it is quicker in its action, more pleasant to take, and less is required to produce the effect for which it is given.

2. Ether is probably safer and appears to be less likely to enfeeble uterine contractions.

What disturbances often attend the end of the first stage?

1. The woman is very apt to vomit, which relaxes and prepares the soft parts and increases the uterine contractions.
2. A rigor sometimes occurs, temporarily suspending labor, but with hot applications to the feet and a hot drink it usually speedily ceases.

What duties are required during the second stage?

1. To rupture the membranes, if this does not occur spontaneously.
2. To observe the descent of the child, and to be ready to remedy any departure from the normal course.
3. To prevent the laceration of the perineum.
4. To complete the delivery of the child.

How are the membranes to be ruptured?

By pressing the finger against them while they are made tense by a contraction. If they are too thick and strong to yield to this, the nail of the middle finger may be prepared as follows: First, make a straight cut in the free border of the nail and in the middle line of the finger. Second, pare away the free border on one side of the cut, which will leave a sharp, knife-like edge.

If the bag of waters is large, it is well to place a cloth in front of the vulva before rupturing, in order to soak up the liquor amnii when discharged.

What occurrences often attend the end of the second stage?

1. The woman wants to sit on the chamber, even when the bowel is empty; due to the pressure of the child's head on the bowel. Of course, she is not to be allowed to sit up at this time.
2. Cramps in the leg often occur from pressure of the descending head against the sciatic nerve. Rubbing the leg affords relief.

How is the perineum to be guarded?

By bringing out the head in the absence of a pain, if possible. When the head greatly distends the perineum, and a part of the occiput protrudes, pass two fingers into the rectum, and place them on the brow, malar bones or chin of the child, as may be convenient. Place the thumb on the occiput. The head may then be controlled and prevented from passing through the vulva during a pain. If, when a pain has subsided the head be now pushed over the perineum, laceration will be prevented. It is also necessary that the woman shall not bear down at this time.

What is episiotomy?

An operation designed to save the perineum, by making small incisions into its margin, on either side of the median line.

What is to be done when the head is born?

1. Ascertain if the funis is around the child's neck, and if so, unwind it.
2. If no uterine contraction appears to be forthcoming, pass a finger into the vagina, below the child's neck, and hooking it into an axilla, withdraw the child, taking care that the shoulders do not lacerate the perineum.

What is the first attention to be rendered to the child?

1. Pass a finger into its mouth to remove any mucus which may be there.
2. If it does not at once cry, give it a slight spank on the buttocks, or use other means of resuscitation, until it gives a good cry.
3. When it has cried well, tie the cord.

How is the cord to be tied?

A ligature of several strands of sewing thread or other material should be tied two or three finger breadths from the child's navel. A second ligature should be applied several inches from this, and the cord cut between the ligatures with scissors. If there is much Wharton's gelatine in the cord it is well to hold it firmly at the navel, and endeavor with the finger and thumb to squeeze out the gelatine or "strip" the cord. After cutting the cord see that the ligature is firm, and that no blood is escaping, and hand the child to the nurse.

How is the cord to be dressed?

The physician is usually expected to dress the stump of cord attached to the child. Take a piece of linen or muslin (old and soft) about four inches square; cut a hole in the middle large enough for the cord to pass through; slip it over the stump and fold it so as to thoroughly cover it.

How may a child be resuscitated when apparently still-born?

If it does not at once respond to spanking or dashing water upon its chest, resort at once—

1. To Sylvester's method of artificial respiration, or,
2. To mouth to mouth insufflation. Wipe the baby's face, compress the nostrils with the fingers of one hand and press the other hand upon its epigastrium. Then apply your mouth to the child's, and blow into it. The pressure of the second hand prevents the air from entering the intestines.
3. A galvanic battery may be used.

What attentions are to be rendered to the woman?

1. The placenta is to be delivered after the manner of Credè (*vide* p. 53).
2. The soiled clothing is to be removed and a napkin placed at the vulva to receive the discharges.
3. A broad bandage or "binder" should be applied around the abdomen.
4. The uterus should occasionally be felt through the abdominal walls, to be sure it remains contracted.

What is the position of the womb after delivery?

Just after the delivery of the placenta the womb should be in the hypogastrium, its fundus reaching half way to the umbilicus, and feeling as hard as a stone. In a short time (generally within the hour), the abdominal muscles regain their tonicity, and the "retentive power of the abdomen" draws the womb upward, its fundus reaching nearly or quite to the umbilicus.

Why does a rigor often occur just after labor?

1. The bedding and clothes are apt to be wet with the discharges.
2. The withdrawal of the child takes away a source of bodily heat, its temperature being nearly a degree higher than that of the mother.

When may the physician leave, and when should he return?

He may leave within half an hour, if the woman has been cared for as above, and is in good case. He should return within from twelve to twenty-four hours; and in general those who watch their patients best will have the least trouble.

What are after-pains?

The pain sometimes experienced after labor, due to the contractions of the uterus. They are rarely felt by primiparæ, and usually increase in severity with each subsequent labor. They may occur only a few times, or may keep up for several days. If severe enough to need treatment, opium and camphor, in powder, or as in paregoric, will be the proper remedy.

What is the caput succedaneum?

An œdematous swelling formed on the part of the presentation in advance; caused by the pressure upon the circulation in the presenting circumference, by the grip of the cervix, vagina, and pelvic walls. It forms only when the head is arrested at any point for some time.

How long does it remain?

For several days after birth, if not interfered with.

THE MECHANISM OF LABOR.

What is meant by the mechanism of labor?

The direct mechanical movements involved in the passage of the child through the pelvis, in distinction to the vital and clinical conditions connected with the process.

With what is the mechanism of labor concerned?

With three things. 1. The body to be propelled.
2. The tube through which it is propelled, and
3. The propelling force.

What is the propelling or motive force in labor?

1. The contractions of the uterus, principally, aided by
2. The contractions of the abdominal muscles.
3. The elastic resistance of the perineum.

Fig. 1.

A, Perineum; B, the direction of the uterine force; C, The direction of the perineal force; D, The resultant of the two forces, in which the head moves.

When is the first or uterine force exerted?

Throughout the entire labor, and is the main and necessary force.

When is the second or abdominal force exerted?

It may be voluntarily exercised at any time, but usually is reflexly excited when the head is low in the pelvis, becoming almost involuntary.

What effect has the abdominal force?

1. It aids the uterine force directly, by pushing the child onward, and
2. Indirectly, by holding the womb down and preventing it from being pushed upward by the pelvic resistance to the passage of the child.

When and how is the perineal force exerted?

After the child has reached the outlet, it can go no further without passing through or over the perineum. The uterine force is unable to propel it in any direction except against or through the perineum. A new force is therefore provided in the elastic resistance of the perineum, which tends to push the head back in *nearly* the opposite direction (a little forward as well). Therefore the head moves in the resultant of the two forces, and *over* the perineum.

What form does the child assume when packed in the womb?

It is substantially an ovoid, or egg-shaped figure, the extremities being flexed and pressed against the trunk.

What relations may it assume to the pelvic inlet?

Either end (the head or breech), may be opposite the inlet, or it may lie transversely across it.

What is the presentation of the child?

That part of the child in advance, or, more accurately, that part of the child included within the circumference of the inlet at the beginning of labor.

How many presentations are there?

Four.
I. The *vertex.*
II. The *face.*
III. The *breech.*
IV. *Transverse.*

Which is the most common?

The vertex presents in over 90 per cent. of all labors.

What distinguishing marks exist upon the head?

I. Sutures. II. Fontanelles. III. Protuberances.

I. Sutures.
1. The *sagittal* suture and its continuation, the *bi-frontal,* extends antero-posteriorly between the parietal and frontal bones.
2. The *lambdoidal* suture extends from the posterior limit of the sagittal suture, between the occipital and parietal bones, making a V-shaped line.
3. The *coronal* suture extends between the parietal and frontal bones, crossing the sagittal at right angles.

II. Fontanelles.
1. The *posterior fontanelle,* a small, triangular enlargement of the sutural membrane at the junction of the sagittal and lambdoidal sutures.
2. The *anterior fontanelle,* a large, quadrilateral enlargement of the sutural membrane, at the junction of the sagittal and coronal sutures.
3. The *postero-lateral* fontanelles, one on each side, at the inferior limits of the lambdoidal suture.

III. Protuberances.

1. The *parietal protuberances*, called also eminences or bosses, situated in the centre of each parietal bone.
2. The *frontal* protuberances, situated in the centre of the occipital bones.
3. The occipital protuberance, situated in the centre of the occipital bone.

What is the object of the sutures and fontanelles?

They admit of the mobility and overlapping of the bones, so as to diminish the size of the head in labor. Incidentally they furnish us with important "landmarks." The overlapping edge of bone is usually felt, rather than the suture itself.

What are the diameters and planes of the fœtal head?

The diameters are lines drawn from one point to another; the planes are imaginary levels drawn transversely through different points of the head; each for the purpose of facilitating the description of the relation of the head to the pelvis in labor.

Name the diameters and planes.

Diameters.

1. The *occipito-frontal* diameter, drawn from the middle of the bi-frontal suture to the occipital protuberance, and measures about 4¾ inches.
2. The *cervico-frontal* diameter, drawn from the apex of the forehead to the occipital ridge or nape of the neck, and measures a little less than 4 inches, or 4 — in.
3. The *cervico-bregmatic* diameter, drawn from the posterior border of the anterior fontanelle to the nape of the neck, and measures 3¾ inches.
4. The *bi-parietal* or transverse diameter, drawn from one parietal protuberance to the other, and measures 3¾ inches.
5. The *occipito-mental* diameter, drawn from the occipital protuberance to the point of the chin, and measures 5⅛ inches.

Planes.

1. The *occipito-frontal* plane, drawn transversely through the occipito-frontal diameter (or through the occipito and frontal protuberances); when the head is neither flexed nor extended (the body being erect), this plane is exactly horizontal (corresponds to the plane of the horizon).
2. The cervico-frontal plane, drawn transversely through the cervico-frontal diameter. When the head is *half flexed*, this plane is horizontal, and therefore may be called the plane of demi-flexion.

3. The cervico-bregmatic plane, drawn transversely through the cervico-bregmatic diameter. When the head is *completely* flexed, this plane is horizontal, and therefore may be called the plane of complete flexion.

What outline is intercepted by these planes?

In the occipito-frontal an elliptical outline; long diameter 4¾ inches. Transverse diameter 3¾ inches.

In the cervico-frontal an elliptical outline; long diameter 4 — inches. Transverse diameter 3¾ inches.

In the cervico-bregmatic, a circular outline; long diameter 3¾ inches. Transverse diameter 3¾ inches.

What important deduction may be drawn from these facts?

The more the head is *flexed* the *smaller* is the outline presented.

In how many ways may the vertex enter the pelvis?

The elliptical outline of the head may enter with the *occiput* in front and to the left or right, and behind and to the right or left. There are, therefore, four positions of the vertex, named as follows:—

1. Left Occipito-Anterior.
2. Right Occipito-Anterior.
3. Right Occipito-Posterior.
4. Left Occipito-Posterior.

How many positions are there of the Face presentation?

Since the face has also an elliptical outline, with the *mentum* or chin at one end, we have the same arrangement as in the vertex, or:—

1. Left Mento-Anterior.
2. Right Mento-Anterior.
3. Right Mento-Posterior.
4. Left Mento-Posterior.

How many positions are there of the Breech presentation?

Since the breech has also an elliptical outline, with the *sacrum* in a direct line with the occiput, we have the same arrangement as in the vertex, or:—

1. Left Sacro-Anterior.
2. Right Sacro-Anterior.
3. Right Sacro-Posterior.
4. Left Sacro-Posterior.

How many positions are there of the Transverse presentation?

For the sake of uniformity we may assume an elliptical outline for the shoulder, with the *dorsum*, or back of the shoulder, as the name-point. This gives us the same arrangement as in the other presentations, or:—

1. Left Dorso-Anterior.
2. Right Dorso-Anterior.
3. Right Dorso-Posterior.
4. Left Dorso-Posterior.

How may the positions be more briefly designated?

By initials, as L. O. A. for left occipito-anterior, R. S. P., for right sacro-posterior, and so on.

How may these sixteen positions be represented in a single scheme?

Left	Occipito Mento Sacro Dorso	Anterior.	Or by initials only.	L	O. M. S. D.	A.
Right		Anterior.		R		A.
Right		Posterior.		R		P.
Left		Posterior.		L		P.

How is the head situated at the beginning of labor in the L. O. A. position?

The occiput points to the left ilio-pectineal eminence; the bi-frontal suture is opposite the right sacro-iliac symphysis, and the sagittal suture lies in the right oblique diameter.

What is the mechanism of delivery in the L. O. A. position?

1. *Flexion* occurs, whereby the cervico-frontal, or even the cervico-bregmatic diameter, is substituted for the occipito-frontal, thus reducing the outline presenting in the pelvis.
2. The head *descends* in the pelvis, and at the same time a *leveling* movement occurs by which the forehead descends more rapidly than the occiput, and becomes level with it.
3. While the head descends it also *rotates*, so that the sagittal suture is finally brought into the median line by the time the head reaches the pelvic outlet: the shoulders, having also rotated, occupy the transverse diameter of the outlet.
4. When the head reaches the outlet the occiput or nape of the neck remains fixed under the sub-pubic arch, while the forehead and face sweep over the perineum by a movement of *extension*.
5. After the head is born it undergoes a movement of *external rotation*, or *restitution*, because the shoulders occupying the transverse diameter of the outlet, now undergo a movement of *internal rotation*, so that

the bis-acromial diameter is finally brought into the median line, the right shoulder turning under the pubic symphysis.

6. The right shoulder is now forced down under the sub-pubic ligament, and, the trunk pivoting upon the arm just below the shoulder, *delivery of the body* occurs, by a movement of latero-flexion.

What variations occur in the mechanism of the L. O. A. position?

If there is not a close fit between the head and pelvis there may be less flexion and rotation, but no substantial difference in the mechanism occurs. The shoulders may vary greatly, due usually to the length of the neck and the time when they are compelled to follow the head. Thus, they may enter the pelvis directly transversely and rotate indifferently into either oblique diameter, and at any level, which will also control the movement of restitution.

What is the mechanism of delivery in the R. O. A. position?

The same as in the first, or L. O. A. position, except that the sagittal suture is in the left oblique diameter, and the occiput directed toward the right ilio-pectineal eminence; and in general the same description will apply throughout, substituting right for left, and vice versa.

How often does this position occur?

Very seldom, owing to the infrequency of left lateral obliquity of the womb, and the presence of the rectum on the left side of the pelvis.

How is the head situated in the R. O. P. position?

The occiput is opposite the right sacro-iliac symphysis, the forehead opposite the left obturator foramen, and the sagittal suture lies in the right oblique diameter.

What is the mechanism of delivery in R. O. P. position?

There are four different processes by which it may be terminated,

1. Anterior rotation at the inlet.
2. Anterior rotation at the outlet, or during descent.
3. Anterior rotation on the perineum, and,
4. Posterior rotation throughout.

What is meant by anterior rotation?

The rotation of the head so as to bring the occiput in front, thereby converting the position into an R. O. A.

How does anterior rotation occur?

1. From the fact that the foramen magnum is near the occipital end of the head, the shoulders are thrown further back in this position, and

therefore the right shoulder impinges upon the vertebral column or promontory. If it should be pushed off on the right side the child's back will be brought in front. This twists the neck, and the untwisting force of its elastic structure tends to rotate the head with the occiput in front. This occurs most easily at the inlet, next at the outlet or during descent, and rarely, even when the head has reached the perineum.

2. The resistance of the posterior pelvic wall to the occiput is greater than that of the anterior wall upon the forehead, owing to the narrowing of the pelvis under the sacro-iliac arch, which also aids in anterior rotation, and according to some, is the only cause.

What must occur before anterior rotation ?

Flexion, continued until the circular cervico-bregmatic outline is reached.

Under what circumstances does posterior rotation occur ?

If the child's back is turned toward the mother's back, and remains so, the head cannot rotate anteriorly, and is delivered with the forehead under the sub-pubic arch.

What difficulties are encountered in posterior rotation ?

1. The labor is more prolonged, because the uterine force is transmitted through the posterior and narrow portion of the pelvis.
2. The perineum is endangered, because the head cannot be fully flexed while passing over it.

How may we recognize the R. O. P. position ?

1. At the beginning of labor the anterior fontanelle (usually large) will be found very accessible in front, and to the left.
2. As flexion occurs the fontanelle will move upward and become less accessible, which is directly the reverse of the course followed by the posterior fontanelle in L. O. A.

How should the R. O. P. position be managed ?

As soon as discovered, a reasonable effort should be made to rotate the shoulders with the back in front, by external manipulation. This may be aided by two fingers placed upon the vertex, and similarly employed in endeavoring to rotate the head. If these efforts fail, we may leave the case to the uterine efforts, until it is evident that natural delivery will take too long, when we should employ the forceps.

What is to be avoided ?

Attempts to rotate the head without reference to the position of the shoulders. It endangers the child's life, from over-twisting of the neck, and is rarely successful.

What is the mechanism of delivery in the L. O. P. position?

The same as in the third or R. O. P., except that anterior rotation converts it into an L. O. A., and in general left is to be substituted for right, and vice versa, throughout the description.

What are the causes of the Face presentation?

1. From a misdirection of the uterine axis (due to pendulous abdomen and the like) the contractions may propel the head, originally presenting the vertex in such manner that its occiput is arrested at the brim, while the facial end, being free, descends. Thus an L. O. A. may be converted into an R. M. P., and an R. O. P. into an L. M. A.
2. External violence or jarring may disturb and change the presentation.
3. The child may, by reflex movements, extend its head.

What plane and diameters are described in the Face presentation?

A plane drawn through the anterior limit of the anterior fontanelle, the malar bones and the junction of the chin and neck, is called the *trachelo-bregmatic* plane.

It is of elliptical outline, and nearly parallel to the cervico-bregmatic plane, but smaller. Its long diameter is called the trachelo-bregmatic; its transverse diameter, drawn from one malar bone to the opposite, the *bi-malar*.

How is the head situated in the L. M. A. position?

The chin is opposite a point in front of the left acetabulum; the anterior fontanelle is opposite the right sacro-iliac symphysis. The features of the face (eyes, nose, mouth, etc.) may be felt between the points.

What is the mechanism of delivery in the L. M. A. position?

The head descends with its trachelo-bregmatic diameter presenting in the right oblique diameter, and without difficulty, until the cervico-bregmatic plane has entered the pelvis. By this time the diameter of the neck or upper part of the chest is added to the cervico-bregmatic diameter, and this constitutes too large a bulk to pass. Delay therefore occurs.

How is this difficulty overcome?

As soon as the head can reach far enough to be acted on by the perineum, the perineal force (see page 60) will cause the head to be flexed, and allow it to sweep easily over the perineum. Therefore, if the head is small, or the neck long, there may be no delay in flexion and delivery. Otherwise the head must remain stationary until it is moulded and wire-drawn, so as to enable it to reach to the perineum.

What effect has this delay, etc., upon the child?

1. It is endangered by the pressure upon its cervical structure.
2. The caput succedaneum forms easily upon the face, and the parts may be perilously swollen and infiltrated.

What treatment is demanded, and why?

Since the delivery can be readily accomplished by securing flexion after the face has reached the inferior strait, we should assist the mechanism—

1. By attempting to flex the head with the fingers, and
2. With the forceps, if the fingers fail, or traction is necessary to bring the head low enough to be flexed.

What is the mechanism of the R. M. A. position?

The face enters the pelvis with the chin in front and to the right, and in general the same description will apply, substituting right for left and vice versa, throughout.

What is the mechanism of the R. M. P. position?

1. The trachelo-bregmatic plane enters the pelvis with the chin opposite the right sacro-iliac symphysis. The forehead remains stationary at the front part of the brim, while the base of the skull and upper part of the chest attempt to advance under the sacro-iliac arch, which is impracticable.
2. The shoulders will thus be made to impinge upon the vertebral column, and will have a tendency to be pushed to the right of the promontory, with the back in front. This will twist the neck, and tend to rotate the head into an R. M. A. position, when the labor is terminated as in that position.

The key to the mechanism, therefore, is *anterior rotation* at or near the inlet. If this fails to occur, the head and chest become tightly wedged, and unless the head is very small, or the pelvis large, delivery is impossible.

What is the mechanism of the L. M. P. position?

The face enters the pelvis with the chin behind and to the left, and in general the same description will apply, substituting left for right and vice versa, throughout

What is the Brow presentation?

A variety of the Face presentation, the upper part of the face presenting. It is either converted into a full face or into a vertex presentation, or cannot be delivered naturally unless the head is very small.

What plane and diameter are described in the Breech presentation?

A plane drawn transversely through the ilia and sacrum called the bis-iliac, from its long diameter, drawn between the crests of the ilia. It is of elliptical outline and almost identical with that of the shoulders.

How is the breech situated in the L. S. A. position?

The sacrum is in front of the left acetabulum, the right ilium under the left sacro-iliac symphysis; the left ilium in front of the right acetabulum, and the pubes in the free space in front of the right sacro-iliac symphysis.

What is the mechanism of the L. S. A. position?

The bis-iliac diameter enters the pelvis in the left oblique diameter, rotating during descent, so that when it arrives at the vulva, the left ilium is directly in front and the sacrum directly toward the left side. Since the breech is quite compressible, advantage is taken of this to enable it to pass out of the vulva with less distention of the perineum, by one of the hips passing in advance of the other. The breech being born, the body and legs emerge, next the shoulders, following the same mechanism, and finally the head, which enters in the right oblique diameter, and passes down strongly flexed.

What is the mechanism of the R. S. A. position?

The same as in the first, substituting right for left, etc.

What is the mechanism of the R. S. P. and L. S. P. positions?

So far as the breech is concerned, the mechanism is the same as in the sacro-anterior position (making allowance for change in *direction*). But when the head enters the pelvis it will be in an occipito-posterior position, and there will be the same need for anterior rotation as in the corresponding vertex positions.

What dangers are connected with the breech presentation?

1. Compression of the funis.
2. Premature respiration.
3. Inhalation of mucus, etc.
4. Extension of arms over head.
5. Extension of the head.
6. Rupture of the perineum.

How may the funis be compressed?

If there is any delay in the birth of the head after the body is born, the funis may be compressed between the head and pelvic walls, thus asphyxiating the child.

What is premature respiration?

After the birth of the body, the contact of air may excite respiration, and abolish the placental circulation. Delay after this may result in asphyxia.

How may inhalation of mucus occur?

The child may respire while the head is detained in the passages, and may draw mucus or fluids into the lungs, causing either asphyxia or pneumonia after birth.

How may the arms be extended?

The arms are naturally flexed upon the child's body, and pass out with it, but if arrested by the pelvic walls, they may be extended alongside of the head, increasing its diameter, and making delivery impossible until they are brought down.

How are the arms to be brought down?

One or two fingers are to be passed by the child's head and laid upon an arm from behind. The arm is then to be pushed across the child's *face*, and so on until brought down by the side of the body. This may be repeated with the other, if both are extended.

How may the head be extended?

The head is usually so tightly grasped by the uterus and vaginal walls as to be kept flexed, but if the pelvis is small, or improper traction is made upon the body, it may be extended, and will then present a large outline in passing through the pelvis. This makes its advance more difficult, and may cause a laceration of the perineum.

What is the fœtal mortality in the breech presentation?

From thirty to fifty per cent.

How should a breech case be managed throughout?

As a rule it should not be interfered with until the breech is born. The physician should then—

1. As soon as the hips are delivered, draw down a loop of the cord, as otherwise it may be compressed between the child's head and the pelvic brim during the descent of the former, and, not being able to pass down as rapidly as is required, it may be torn off at the umbilicus or so stretched as to interfere with the placental circulation. If the cord is pulsating strongly, place the loop thus drawn down out of the way in the postero-lateral part of the pelvic excavation. If the pulsation is feeble or absent, hurry the delivery.
2. As the shoulders are coming down, endeavor to secure anterior rotation if it is in a posterior position.
3. As soon as the body is born, bring down the arms, if extended.
4. If the head is not at once born, pass two fingers to its mouth, to secure a supply of air and to admit of respiration.

5. Draw the body down against and parallel to the perineum (to flex the head). Then elevate the body, turning it over on the mother's abdomen while making traction. An assistant, if possible, should press upon the hypogastrium, to force the head down. Repeat the manœuvre, if necessary.

What caution is necessary in pulling upon the child's body?

The neck breaks with the weight of 100 pounds, and decapitation occurs with 120 pounds. (Matthews Duncan.)

Under what circumstances is earlier interference indicated?

When the labor is unduly protracted we may suspect that the soft breech is spreading out and being wedged in the pelvis, rather than being molded into a shape suitable for passing. We may then—

1. Carefully introduce the hand and bring down one or both legs to use in making traction, or
2. We may use a *fillet*. Pass a silk handkerchief or roller bandage over the child's groin, to use in making traction. A "blunt hook" or other metallic instrument should never be used on a living child.

What varieties of the breech presentation occur?

One or both feet or legs may come in advance of the breech, which is called a Breech footling.

How does the descent of one or both feet affect the mechanism?

Very little, except by offering a temptation to pull upon them, and thus to extend the arms and head. The first stage of labor may be longer, from the want of an even dilating wedge in the os.

How is the child situated in the L. D. A. position?

The right shoulder presents in the os uteri, the head lying in the left iliac fossa and the breech in the right iliac fossa, or a little higher.

How is the child situated in the R. D. A. position?

The left shoulder presents in the os, the head lying in the right iliac fossa, and the breech in the left iliac, or a little higher.

How is the child situated in the R. D. P. position?

The right shoulder presents in the os, the head lying in the right iliac fossa, and the breech in the left iliac fossa, or a little higher.

How is the child situated in the L. D. P. position?

The left shoulder presents in the os, the head lying in the left iliac fossa, and the breech in the right iliac fossa, or a little higher.

What are the modes of delivery in the transverse presentation?

There is no natural mechanism, but

1. The child, if very small, may be doubled up and expelled. (Rare.)

2. The child may be spontaneously turned in utero, so that it becomes either a vertex or breech presentation. (Rarer.)
3. After the child has been doubled up the breech may be pushed down after great efforts. This is called spontaneous evolution. (Rarest.)

How should transverse presentation be managed?

We should not await any of the spontaneous methods, but turn the child to a vertex or breech presentation. (See Version.) If this is impossible, we will have to perforate the chest and reduce the size of the child. (See Embryotomy.)

What variety of the transverse presentation occurs?

The hand or arm may be in advance of the shoulder, and may present at the vulva. Care should be taken not to confound the hand and foot with each other.

What anomalous presentations are occasionally observed?

1. The body of the child may be so doubled that the feet present with the vertex or face. 2. One or both hands may be added to the vertex or face presentation. 3. The funis may present with any of the others.

PATHOLOGY OF LABOR.

DYSTOCIA.

What is dystocia?

The technical name for labor which departs from the normal standard.

How is labor rendered abnormal?

By disease, defect or accident affecting—

1. The motive force. 2. The fœtus and its attachments. 3. The mother's tissues or general condition. We have, therefore, three classes of dystocia: 1. Uterine; 2. Ovular; 3. Maternal.

In what way may the motive force be affected?

It may be: 1. Excessive. 2. Deficient. 3. Irregular.

What evils may excessive uterine action occasion?

1. Precipitate labor, involving a too sudden emptying of the womb, with laceration of the cervix and perineum.
2. Rupture of the womb when there is much resistance. Opium, chloral or anæsthetics will control it.

What is deficient action?

Uterine *inertia*, or any deficiency in the power, length or frequency of the uterine contractions.

What evils may uterine inertia occasion?

The principal one, and which involves many evils, is *delay* in the labor. Delay is hurtful, more or less, according to the stage in which it occurs.

1. At all times the protraction of labor beyond its normal limits enfeebles the mother and endangers the child's circulation.
2. In the second stage additional dangers arise, from pressure upon the maternal tissues, with possibilities of sloughing, fistulas and septic processes.
3. In the third stage inertia may lead to fatal hemorrhage, thrombosis in uterine sinuses, with subsequent septicæmia and other diseases.

What are the causes of uterine inertia?

1. Defective innervation or circulation of the uterus.
2. Paralysis of the uterus from over-distention.
3. Organic defects in the uterine muscles.

In what ways may the innervation and circulation of the womb be affected?

The nervous supply of the uterus being spinal, cerebral (vaso-motor) and ganglionic, it may be affected by mental emotion, the shrinking from pain of the hysterical temperament, improper ventilation, or from either direct or indirect disturbance of the uterine centre. The latter may be occasioned by malarial poisoning or by reflex influences from other disturbed organs. Premature rupture of the membranes is frequently associated with inertia, probably as cause.

How may the uterus be paralyzed from over-distention?

The walls of the uterus may be mechanically over-distended by twins or dropsy of the amnion, making the contractions feeble.

What organic defects are met with?

The uterus which has frequently gone through the processes of pregnancy often has its fibrous and uncontractile element increased at the expense of the muscular tissue. This decreases the power of the uterus; hence, old multiparæ frequently have protracted labor from this cause. It is said that fatty degeneration sometimes occurs.

How should uterine inertia be treated?

If sufficiently great to unduly prolong labor we should—

1. Endeavor to ascertain and remove the cause.
2. Place the woman under the best hygienic conditions.
3. If the source of reflex disturbances cannot be removed, we may quiet the nerve centre by chloral, opium or the bromide of potassium, after which the inertia is commonly relieved.

4. Quinine is always useful in malarious districts.
5. Massage and stroking of the uterus through the abdominal walls may be tried.
6. If over-distention exists we should early rupture the membranes.
7. In the second stage we may *supplement* the uterine force (*a*) by Kristeller's method, (*b*) by the forceps.

What is Kristeller's method?

Place the hands on the abdomen (facing the woman's feet). Endeavor at intervals to *push* the child through the pelvis. Called also *expression.*

What should be avoided in treating inertia?

The use of oxytocics.

What are oxytocics?

Drugs credited with the power of directly affecting the uterine muscle, and of causing or strengthening contractions, such as ergot, cinnamon, borax, and many others. Of these the one most used is ergot.

What objections exist to the use of ergot in labor?

It is uncertain in action, and when it does act, causes tonic contraction of the uterus and an unremitting effort to expel the child. If this takes place before the os is dilated laceration of the cervix may occur; if the head is large, rupture of the womb may occur; in any event, the placental circulation will be continuously compressed, and the child in danger of asphyxia. Ergot should never be given before the birth of the child, and from its uncertainty, should never be depended upon in the third stage.

What objections exist to the use of stimulants?

A dose of whiskey is often given, increasing the woman's courage, and the contractions of the abdominal muscles. But if labor is not speedily terminated, reaction follows, and the labor will be retarded.

What is irregular action of the uterine force?

Irregular contraction of special fibres instead of general contraction of all. Its typical form is called "ante-partum hour-glass contraction." In this condition, a circular band of fibres, usually a little above the cervix, contracts firmly and tonically, while the rest of the womb remains inert. This holds the child tightly in the womb, and suspends normal contractions.

How should this be treated?

Relaxation should be attempted by anæsthesia or by emetic doses of ipecac. These failing, our only resource is in artificial delivery by forceps, or embryotomy.

What obstructions to delivery are encountered in the maternal tissues?

1. At the os uteri; rigidity, œdema, atresia, or displacement.
2. In the vagina; fibrous bands, atresia, persistent hymen.
3. An unyielding perineum.
4. Tumors, including a distended bladder or rectum.
5. External; œdema and thrombus of the labia; hernia.
6. Deformities of the pelvis.

What is rigidity of the os (or cervix) uteri?

An unyielding and undilatable condition, due—

1. To organic changes, and 2, to temporary spasmodic contraction of the oral fibres. The first form is due to inflammatory or hypertrophic conditions by which the cervical fibres have become thickened and fibrous. The second form may occur at any time during the first stage of labor, and is usually associated with uterine inertia.

How may organic and functional rigidity be distinguished?

1. In organic rigidity the edges of the os are *thick* and *dense*, and the cervix has not entirely disappeared.
2. In rigidity from spasm the edges of the os are *thin* and *tense*, giving the sensation of sharp, wiry resistance. It is also associated with some constitutional disturbance, the woman being nervous and fidgety and the vagina hot and less moist than usual.

What treatment is indicated?

1. In organic rigidity the uterine contractions should be allowed ample time to force open the os; this failing, incisions should be made with a bistoury. The patient should be placed in Sim's position, the speculum introduced, and the incisions made radiating from the os, to a sufficient extent to allow the head to come through with or without the forceps. The condition is rare, and such extreme measures are rarely called for.
2. Functional rigidity depends upon much the same causes as uterine inertia, and demands similar hygienic treatment. Chloral, gr. xv, every hour, will be found effective. Over-stretching may be used. This is accomplished by inserting the index and middle fingers within the os, and spreading them forcibly, so as to stretch the oral fibres. The fingers exert so little real force that no judicious person can do harm with this procedure. It may be repeated in an hour, or with two or three successive contractions. If necessary, Molesworth's or Barnes' dilators may be used, to dilate with more force and rapidity.

What is œdema of the cervix?

An infiltration of serum, especially into the anterior lip of the cervix, which impairs its dilatability. It is due to pressure from the child's head.

What is the indication for treatment?

To remove the cause; as long as the head remains the swelling will continue; hence deliver with forceps before it becomes too extensive.

What is atresia of the os uteri?

Entire closure of the os, due to inflammatory adhesions of the cervical lips. It is very rare, and demands similar treatment to organic rigidity.

What is displacement of the os uteri?

Removal of the os from its usual place in the vagina, usually due to a forward displacement of the fundus. This in turn is due to a relaxed condition of the abdominal muscles. [Cases are recorded in which the fundus of the womb rested on the woman's knees, in the sitting posture, throwing the os so far back as to make it inaccessible.] The same condition is sometimes caused by tumors, displacing the womb in any direction, but the usual displacement of the os is backward, toward the promonotory.

What are the dangers of this condition?

1. The child's head is pressed against the anterior wall of the cervix, and is unable to leave the womb, unless through a rent in the anterior wall.
2. The incautious examiner may mistake the thinned wall for the membranes, and make the rent himself. This condition is common enough to warrant every one in making the discovery of the os and the condition of its edges the first duty in labor.

What treatment is indicated?

Replace the womb by pushing the fundus backward, while, if possible, the finger is hooked into the os and it is pulled forward. If the displacement has been great, a bandage should be applied around the abdomen, to retain the uterus in position.

What treatment is indicated for a small vagina, obstructive bands, etc.?

A vagina small enough to impede delivery will require the forceps to be used. Bands or a persistent hymen may be incised. While the head distends and makes tense the band, a knife placed between the head and band is allowed to be pushed through. Care should be taken to cut as little as possible, and to tear rather than cut after the edge is severed.

How may the perineum obstruct labor?

1. The perineum may be congenitally defective in structure, or have been imperfectly developed during pregnancy, constituting organic rigidity. 2. Or its muscular fibres may be in a condition of spasm, or functional rigidity. The same measures may be used which are applicable in rigidity of the cervix, but the forceps may be used instead, which render us independent of the perineum.

What is to be done when tumors obstruct delivery?

The treatment of a distended bladder and rectum is obvious. Empty them. No rule can be laid down for other tumors. If the tumor is safely removable or can be diminished in size, it may be done. If not, the child must be lessened in size.

What treatment do the external tumors (œdema, thrombus and hernia) require?

1. When œdema of the labia is extensive enough to obstruct delivery, a number of punctures should be made with a fine bistoury, which will speedily drain and remove it.
2. A large thrombus occasionally distends the labium obstructively. A free incision should be made, the clot turned out and hæmostatics applied if necessary.
3. Hernia rarely complicates labor. If irreducible, it requires avoidance of bearing down.

DEFORMED PELVIS.

In what parts is the pelvis deformed?

It may be generally contracted throughout, or the deformity may be limited to the inlet or outlet.

What is the generally contracted pelvis called?

The pelvis æquabiliter justo minor.

What difficulties does it occasion in labor?

A small head will pass through it with the normal mechanism. A large head will be unable to pass unless aided by the forceps.

In what ways is the inlet deformed?

1. *Inflammation* of a sacro-iliac or hip joint occurring during the developmental period, may so affect one sacro-iliac arch as to materially lessen one oblique diameter. This may not affect the opposite oblique diameter, or there may be a flattening of the whole inlet, contracting the conjugate diameter, and lessening the calibre of the remaining canal.
2. *Rachitis* may so affect the pelvis as to cause a flattening of the inlet

and contraction of the conjugate diameter, entirely obliterating the normal condition of the canal.

3. *Osteo-malacia*, or softening of the bones, may distort the inlet in a variety of ways, always diminishing its effective diameters.
4. Curvature of the spine may, by kyphosis, scoliosis or spondylolisthesis, so displace the promontory as to cause, in effect, the same deformities as in the other classes.

What is kyphosis?

Posterior curvature of the lumbar spine. Its usual effect is to lengthen the conjugate diameter and diminish the transverse diameter by tilting the sacrum backward. Such a pelvis is called "funnel-shaped," a name also given to a pelvis of male type resulting from imperfect development.

What is scoliosis?

Lateral curvature of the spine. It may only impair one side of the pelvis, but, if great, may cause serious deformity.

What is spondylolisthesis?

A slipping forward of the last lumbar vertebra on the sacrum, so as to greatly contract the conjugate diameter.

Do deformities of the inlet affect the whole course of delivery?

Generally the trouble is over when the head has passed through the inlet, the rest of the pelvis being undeformed.

What effect upon delivery is occasioned by deformities of the inlet?

1. The presentation is apt to be irregular.
2. The agreement between the axes of the uterus and pelvis being disarranged, the uterine force is deflected, which protracts both the first and second stage.
3. The normal mechanism of delivery is perverted.
4. The inlet is made too small to admit the child to pass readily.
5. The maternal tissues are more apt to suffer from pressure due to the misdirection of the uterine force.

In what way is the mechanism altered?

1. The head is usually more *transversely* placed, and rotation has to be made through a longer arc.
2. The head has to make a curved passage around the promontory before it can enter the inlet.
3. The narrowing of the pelvis delays the head until it can be compressed and moulded to a suitable size.

How are degrees of deformity estimated?

By the length of the conjugate diameter, as determined by pelvimetry.

How may the conjugate be measured?

Various instruments called pelvimeters are in use, but the most available is the finger of the physician.

One or two fingers are passed into the vagina, and extended so as to reach the sacral promontory. The point at which the anterior commissure of the vulva touches the hand may then be noted, and the reach measured. This is the diagonal conjugate. Deduct an inch from this for the thickness of the pubes, and we have the hypothenuse (x) of a right-angled triangle, in which the real conjugate (y) is one leg, and the inner face of the pubes (z) is another—(Then $x^2 = y^2 + z^2$).

In a normal or slightly deformed pelvis the promontory cannot usually be reached, but in all cases where it is a practical matter, the length of the conjugate can be determined in this manner.

What degree of contraction is compatible with delivery?

Much will depend upon the skill of the physician, but in general terms, it may be said that with a conjugate of three inches or more, a living child *may* be extracted, with or without the forceps; three to two and a half inches, may be delivered by forceps or version, or at worst by craniotomy; two and a half or less, may be delivered by craniotomy, but the statistics show that the Cæsarean section is as safe. (Parry.)

How may the outlet be deformed?

By a narrowing of the transverse diameter, due to a too close approach of the ischia; or of the conjugate diameter, due to anchylosis or rigidity of the sacro-coccygeal joint. The first is rare, and the second common, in old primiparæ.

What treatment is indicated?

Sufficient additional force to enable the head to pass, which is best furnished by the forceps.

OVULAR DYSTOCIA.

What departures from the normal condition occur in connection with the fœtus and its envelopes?

1. The *membranes* (*a*) may rupture prematurely;
   (*b*) may be too tough;
   (*c*) there may be an extra amniotic sac;
   (*d*) there may be hydrops amnii.

How may it be recognized?

By the softness of the head and the enlargement of the sutures and fontanelles. Moderate degrees are not recognized with certainty until the forceps are applied, when the wide divergence of the handles show the increased bulk of the head.

How should it be managed?

Simple perforation of the skull will allow the fluid to escape, and permit the collapsed cranium to be withdrawn. The brain should also be broken up before the child is withdrawn.

How may hydrothorax and other enlargements of the fœtus obstruct delivery?

Effusion of serum in the chest (hydrothorax), abdomen (ascites), external cellular tissue (œdema), may enlarge the bulk of the child and obstruct delivery. The joints may be anchylosed in such a position as to increase its bulk. A child dying in utero and becoming putrid may be swollen, but usually causes trouble only by poisoning the mother.

In any of these cases it may be necessary to reduce the bulk of the child by embryotomy.

How is prolapse of the hand or arm by the head to be treated?

The prolapsed member is to be pushed up, as in the case of prolapse of the funis. If the arm is behind the head (Simpson) and the diagnosis can be made, turning is indicated.

In what way may the foot or feet complicate head presentations?

One or both feet may present alongside of the head, in which case the child must be more or less doubled up. It may be noticed that these accidents often occur together, feet, arms and funis, in varying proportions, prolapsing at the same time.

How is the complication to be treated?

If recognized before the rupture of the membranes, the feet may either be pushed up or the child turned. If at any time we find turning to be very difficult or impossible, we may know that the child is dead (because difficult to turn and doubled), and at once perform embryotomy.

How may the shoulders give trouble in delivery?

By not entering the pelvis, but catching on the inlets, thus preventing the head from advancing.

How may this be recognized and treated?

By the manner in which the head advances and is retracted, as in the case of a short funis, and by external palpation. By external pressure the shoulders may be pushed into their proper place.

TWIN LABOR.

What is the usual course of twin labor?

After the first child is born a short rest occurs; the pains recur (usually within fifteen minutes) and the second child is born, and so on, if more than two.

What difficulties may occur in twin labor?

1. Both children may attempt to enter the pelvis at once, and become wedged.
2. After one head has reached the outlet the second may enter the pelvis, with the same result.
3. Head locking may occur.

What is head locking?

When the first child is born by the breech, its chin may catch upon the chin of the second child, presenting by the head.

What general rules may be laid down for these complications?

1. To push up one child and allow the other to come down, if possible.
2. When one child is partly born and the other wedged in with it, the first child is to be sacrificed in order to save the second.

What forms of twin monsters complicate delivery?

The principal forms are—

1. Two nearly separate bodies united in front by the thorax or abdomen (ex., Siamese twins).
2. Two nearly separate bodies, united back to back by the sacrum and lower part of spinal column (ex., North Carolina sisters).
3. Dicephalous monsters; the bodies single below, but the heads separate.
4. The bodies separate, but the heads are partially united.

The two latter are almost invariably still-born. (Playfair.)

EFFECT OF MATERNAL CONDITIONS ON LABOR.

What maternal conditions may affect labor?

1. Syncope. 2. Hemorrhage. 3. Rupture of the uterus. 4. Eclampsia.

How does syncope affect labor?

Usually by only temporarily suspending the uterine contractions. If associated with organic heart disease it may prove fatal. The treatment is the same as indicated at any other time.

What forms of hemorrhage are met with?

1. From detachment of a normally implanted placenta, before the birth of the child, or *accidental* hemorrhage.
2. From detachment of an abnormally implanted placenta, before the birth of the child, or *unavoidable* hemorrhage.
3. During and after the third stage, or *post-partum* hemorrhage.

What causes premature detachment of the placenta (accidental hemorrhage)?

External violence and irregular contractions of the womb.

What symptoms does it cause, and why?

Hemorrhage and colicky pains in the abdomen, but either may be absent. The hemorrhage may be concealed, *i. e.*, the blood may dissect up the placenta and membranes without escaping from the womb, or in small quantity only. This will cause distention of the womb and pain. If there is no external hemorrhage the symptoms of loss of blood internally will be present.

What treatment is indicated?

Prompt delivery, on behalf of the child, which, after all, is usually destroyed by the impairment or total stoppage of the placental circulation; and also on account of the mother, if the hemorrhage is at all extensive.

1. The os uteri should be dilated sufficiently to allow the child to pass.
2. The membranes should be ruptured, and the child at once delivered by forceps or version. The membranes should not be ruptured until we can deliver, for the evacuation of the liquor amnii gives just that much more room for the effusion of blood, without any gain in uterine contraction.
3. The woman's strength must be maintained by whiskey or hot milk, and inertia guarded against.

PLACENTA PREVIA.

What is placenta previa?

The implantation of the placenta upon the lower third of the uterine wall. The placenta may be centrally placed over the os uteri; its edge may reach to the edge of the dilated os; or any degree between these extremes may be met with. It is, therefore, divided into central, partial and marginal placenta previa.

How and why does placenta previa occur?

The ovum should be, and usually is, arrested as soon as it enters the womb, by a fold of the mucous membrane.

If these folds are not prominent enough, it may advance until it arrives at the os internum, where the placenta will then be found. It is, therefore, found principally in multiparæ, and in those whose organs are in a relaxed condition.

What is the source of hemorrhage in placenta previa?

The blood pours from the openings in the uterine sinuses when the placenta is detached, and not from the placenta itself.

How soon does placenta previa cause trouble, and in what manner?

Rarely before the sixth or seventh month of pregnancy.

About this time the cervical segment, which is smaller than the fundal region of the womb, has nearly reached its limits of growth. The placenta then grows faster than the womb, and its edge is liable to become detached. Later in pregnancy the os uteri becomes patulous, and this again causes some separation of the placenta. As a result, hemorrhage occurs, more or less profusely. Usually, if rest is enjoined, the opened sinuses are closed by a clot, and the hemorrhage is arrested until further separation takes place.

What are the dangers in placenta previa?

Death of the mother from hemorrhage, and of the child from asphyxia. The maternal mortality is one in four; fœtal mortality one in two to three.

What treatment is demanded when it occurs before full term?

Rest in bed, with or without a *tampon*, will arrest hemorrhage for the time; the sinuses are closed by thrombi, and the case may go on to term or another hemorrhage. If the hemorrhage is great it is safer to induce labor at once, than to wait. Occasionally no hemorrhage occurs during pregnancy, not even in labor.

How should delivery be managed at full term?

1. Introduce one or two fingers within the os (the hand being in the vagina) and dissect the placenta from the uterine wall for about three inches from the os uteri in all directions, pushing it to one side, if necessary.
2. Rupture the membrane, and if there is an unfavorable presentation, turn the child and make the breech engage in the os; or if the head presents, the forceps may be used, if speedy delivery is necessary.

This partial detachment of the placenta will almost inevitably arrest hemorrhage (Barnes). The strength of the woman is then the main point to be cared for, and if in a reasonable time the uterus seems to be incompetent, the child may be delivered by art.

What complications may interfere with this procedure?

A rigid and undilatable cervix, which is often present, because of the thickening of the tissues under the placental insertion.

How is this to be overcome?

In premature cases, or when we are not prepared to dilate, the tampon may be applied for some hours. Otherwise the Molesworth or Barnes' dilators may be used to mechanically dilate the os, if the fingers cannot do it.

What is a tampon, and how applied?

A tampon is a plug made of pieces of cotton, soft rags, or similar materials, packed into the vagina so as to restrain hemorrhage.

1. Place the woman in Sims' position and introduced Sims' speculum.
2. With a pair of dressing forceps introduce a small wad of cotton batting within the os uteri. Continue to add similar pieces until the whole upper part of the vagina is packed with them.
3. Gradually withdraw the speculum, continuing to add cotton until the whole vagina is packed.
4. Apply a compress and T-bandage over the vulva.

A roller bandage or lamp-wick (recommended by Foster) may be used, and will be easier to withdraw.

How long should a tampon be left in place?

Seldom over twelve hours, and in placenta previa it may be necessary to remove it within an hour or two.

What effect has the tampon besides restraining hemorrhage?

It excites uterine contractions, and aids in dilating the os. This should always be considered where these results are not desirable.

What cautions are to be observed with the tampon?

1. The upper pieces should be moistened with a one or two per cent. solution of carbolic acid or other disinfectant.
2. Never introduce it when the membranes have been ruptured, except in the early months of pregnancy, lest bleeding occur above it, distending the uterus.
3. Watch it after it is applied, to see that blood does not flow past or through it. There is no danger if it is properly applied.

What complication may occur in placenta previa after delivery?

The exposed sinuses in the cervical region may not be efficiently sealed, and hemorrhage may continue. The management will be as in post-partum hemorrhages generally.

POST-PARTUM HEMORRHAGE.

What is the cause of hemorrhage post-partum?

An uncontracted or incompletely contracted uterus, whereby the opened sinuses of the placental site are not compressed, and bleeding is allowed. It is also favored by the retention of the placenta, clots (incomplete delivery), and by fibroid tumors. In a slight form, may be due to laceration of the cervix, vagina and perineum.

What are the symptoms of post-partum hemorrhage?

1. Usually the blood pours out so freely as to readily attract attention; if concealed or retained in the uterus, it will occasion the symptoms of internal hemorrhage.
2. The hand placed on the abdomen will not find the womb hard and in the hypogastric region, but soft and at a higher level.

What are the indications for treatment?

1. To empty the womb.
2. To make the womb contract.
3. To cause clots in the opened sinuses, if the womb fails to contract.
4. To support the woman's strength.

How is this treatment to be carried out?

1. The hand should be introduced into the womb, and clots or other contents removed.
2. The hand is reintroduced and moved about, stroking the uterine walls, while the other hand is similarly engaged on the abdomen. This will often succeed in arousing contractions, and lead to the expulsion of the hand from the womb. If not,
3. A handkerchief, soaked in vinegar, may be carried into the womb and squeezed out; or a peeled lemon; or a piece of ice.
4. Injections of hot water (100° F.) may be used.
5. The faradic current may be useful, if at hand.
6. As a last resort, and to cause clots, injections of tincture of iodine, or solution of ferric chloride, diluted one-third, or even of full strength, may be used.

How may post-partum hemorrhage from inertia be prevented ?

By delivering the placenta by the method of Credè.

What internal medication is proper ?

Stimulants, opium and ergot, but no dependence is to be placed upon anything but local treatment. Hot milk is both stimulant and rapidly absorbed.

What is the operation of transfusion ?

Injecting into the circulation blood, milk or other fluid, to replace the blood lost by hemorrhage. To inject blood requires special and costly apparatus and great skill. Milk may be injected with little trouble. Care must be taken to avoid injecting air, and not to inject so rapidly as to distend the right side of the heart. For this reason it is safer to expose the radial artery and inject toward the hand, slowly and gently.

What is secondary hemorrhage and its cause ?

Hemorrhage occurring after an interval of several hours or even days, after delivery; it is usually preceded by ordinary post-partum hemorrhage, and may be due to a return of uterine inertia; the detachment of thrombi; retention of pieces of membrane, or clots; displacement of the uterus, from a too tight bandage; and impacted rectum; sitting up too soon, or depressing mental emotions.

What treatment is indicated ?

The same in principle as in immediate hemorrhage, with due attention to the exciting cause.

RUPTURE OF THE UTERUS.

What is rupture of the uterus ?

A tear or laceration in the substance of the uterine body, usually permitting the escape of the child into the abdominal cavity.

Under what circumstances does it occur ?

Generally during the second stage of labor, the rent beginning in the cervix and extending toward the fundus. Rarely the peritoneal covering escapes laceration; also it occasionally occurs early in the labor, or even in premature labors.

What is the cause of rupture ?

During labor there is a tendency for the anterior wall of the cervix to be pulled upward, and for the posterior wall to be pushed downward (D. Berry Hart). If the head becomes packed in the inlet early, so as to prevent the anterior wall of the cervix from being pulled up, the anterior wall just above the head becomes greatly thinned, owing to this upward pulling, and rupture almost invariably begins at this point. The thickened ring of fibres just above the point of thinning is known as Bandl's ring.

What symptoms denote its occurrence?

During or just after a labor pain the woman is seized with an acute and *persistent* pain. The form of the uterine tumor is changed and the presentation is retracted. As blood is effused from the rent, symptoms of internal hemorrhage and shock are added. The fingers passed into the vagina readily recognize the rent, and if the child has altogether escaped into the abdominal cavity the intestines will have prolapsed through the rent.

What treatment is indicated?

1. Preventive; a prompt resort to the forceps when the occurrence is feared.
2. Afterwards, if the presentation is not entirely retracted, an attempt may be made to deliver *per vias naturales*.
3. In any case, unless it can be demonstrated that the peritoneum is unbroken, the abdomen should be opened by an incision, the uterine wound closed by sutures, all blood and fluids removed from the abdominal cavity, and strict antiseptic precautions observed.

What is the mortality from rupture?

1. In cases abandoned to nature nearly all die.
2. When the child is delivered without gastrotomy a few more recover.
3. When gastrotomy is at once performed, 60–70 per cent. recover.

ECLAMPSIA.

What is puerperal eclampsia?

A form of convulsions occurring before, during or after labor, which resembles epilepsy in clinical appearance and uræmic convulsions in cause. The typical form occurs during the second stage of labor.

What is the clinical history of an attack?

1. The patient is suddenly seized with a *tonic spasm*, involving the muscles of the face and thorax, usually of the upper extremities, and occasionally of all the muscles. This tonic spasm lasts for about *one minute* and—
2. Is succeeded by *clonic spasms* or twitchings, lasting for *several minutes*. The convulsions subside and—
3. Are succeeded by *coma*, with stertorous breathing. The patient may

become conscious or the convulsions may be renewed in the same order, keeping up until the patient is exhausted or recovers.

The masseter muscles are contracted tonically throughout the seizure. The interference with respiration causes the face to become red or livid. The duration of each seizure and the interval between, depend upon the severity of the attack.

What prodromic symptoms warn us of an attack?

1. Severe and persistent headache is often complained of before an attack, frequently associated with disordered vision.
2. Albumen in the urine should also put us on our guard.

What is the cause of puerperal eclampsia?

The cause is complex, the main factors being—

1. During pregnancy the blood becomes deteriorated (hydræmic), and the ill-supplied nerve centres become more irritable or convulsable (Barnes).
2. The processes of elimination, especially through the kidneys, become defective, and urea (including other excrementitious matters) is retained in the blood. Therefore the nerve centres are supplied with poisonous or irritating substances, as well as impoverished.
3. Vascular tension is increased during pregnancy, and especially during labor, which intensifies the action of the foregoing factors.
4. During labor the interference with the cephalic circulation (from bearing down, etc.), causes hydræmia of the brain and of the nerve centres specially concerned with eclampsia.

Which of these factors is the most important?

The uræmia, as shown by the fact that 50 per cent. of eclamptics have albumen in the urine.

Wherein does puerperal differ from uræmic eclampsia?

The temperature in the former is high, has been observed as high as 109° F. (Busey); in uræmia it may even be subnormal. The clinical history also differs.

Wherein does puerperal eclampsia differ from other forms of convulsions?

1. In hysteria the spasms are altogether irregular and consciousness is never entirely lost.
2. In apoplexy the condition of coma is permanent, and there is a difference in the size of the pupils.
3. In epilepsy, the history will distinguish, except in labor in epileptics, who rarely have convulsions in labor (Parry).

What point in the etiology is disputed?

The condition of the brain, as to anæmia or hyperæmia.

Traube and Rosenstein assert that hydræmia causes œdema of the brain, which in turn leads to anæmia from pressure upon the capillaries from without. Others assert that anæmia of the brain is essential in eclampsia, and that the base of the brain is anæmic, even when the convulsions are hyperæmic.

What effect upon the cerebral circulation have the bearing-down efforts of the second stage, when eclampsia mostly occurs?

The cervical veins are obstructed and blood accumulates in the brain.

Does this occur when eclampsia takes place before or after labor?

Not demonstrably; and in these cases we conclude that the other factors, notably uræmia, predominate.

What are the indications for treatment in puerperal eclampsia?

1. To relieve the irritability of the nerve centres.
2. To reduce vascular tension.
3. To reduce cerebral hyperæmia.

What preventive treatment is indicated?

1. To eliminate urea, etc., by cathartics, and,
2. To quiet the nerve centres by chloral and bromide of potassium.

What treatment should be employed during the attack?

1. Venesection, as the quickest and most powerful means of reducing the vascular tension, cerebral hyperæmia, and secondarily the nerve irritability.
2. Chloral and bromide of potassium by the mouth, if the patient can swallow, or in double doses by the rectum.
3. Ether or chloroform may be given until the chloral, etc., can be administered and take effect.
4. The labor, if in progress, should be terminated as soon as possible, without violence.
5. Purgatives may be given, especially after delivery.
6. A warm pack, to promote diaphoresis, may be used.

What objections are urged against venesection?

That it is out of fashion, and does not reduce vascular tension in a healthy dog.

Veratrum viride may be used instead, if there is time to wait upon its action.

What drug was especially used before the discovery of chloral and the bromide?

Opium, which relieves the irritability of the nerve centres.

What objections exist to its use?

It allays nerve irritability at the expense of all other indications; when the kidneys are seriously crippled it may, itself, cause death; it is no better than other less dangerous remedies.

MISCELLANEOUS COMPLICATIONS.

What complications may exist during or after the third stage of labor, besides hemorrhage?

1. Placental dystocia, or difficulties in delivering the placenta. 2. Inversion of the womb. 3. Emphysema of the neck. 4. Lacerations of the cervix, vagina and perineum.

What forms of placental dystocia occur?

1. Adherent placenta. 2. Hour-glass contraction. 3. A placenta too large. 4. Clots behind an inverted placenta. 5. Utero-placental vacuum. 6. Placentæ succenturiæ and other anomalies of form.

What is adherent placenta?

The term is properly applied to one that has contracted firm adhesions to the uterine wall, from inflammation during pregnancy. There is usually a history of fixed pain in the uterus. This is rare, but improper traction upon the cord may delay the separation of an otherwise normal placenta?

How is adherent placenta to be treated?

Pass the hand into the uterus, find a detached edge of the placenta, and by a sawing motion with the fingers break through the adhesions.

What is hour-glass contraction?

Irregular or tetanic contraction of a part of the uterine walls, the rest being relaxed, whereby the placenta is grasped and held as if in a sac. It may be complicated, if not caused, by adherence of the placenta?

How may it be recognized?

The hand, introduced into the womb, finds apparently a second os internum high up, caused by the constriction of the muscular fibres of the womb below the placental site.

How is it to be overcome?

The fingers, little by little, and finally the hand, are to be
within the constricting band and its resistance overcome

facilitated by anæsthetics or chloral. The best reliance is upon patient and continuous manual efforts.

How may the bulk of the placenta affect its delivery?

A very large placenta which has fallen centrally upon the os, instead of edgewise, may be too bulky to pass without assistance. The same may occur with a placenta of moderate size, if clots have formed behind it to such an extent as to prevent it from being doubled up.

How is such a placenta to be delivered?

It should be perforated centrally by one or two fingers, which will enable us to hook into and drag it down.

What is utero-placental vacuum?

A rare occurrence, in which the placenta being detached, a pull upon the funis makes a vacuum between the placenta and the uterine wall, converting it into a sucker, resembling in action the leather disk by which the small boy raises bricks from the pavement.

How may it be detected and remedied?

It resembles at first the large placenta, or one enlarged by clots, but as soon as perforated, and the vacuum destroyed, it is delivered with great ease, or even spontaneously expelled at once.

What irregular forms of the placenta are met with?

1. The *battledore* placenta, in which the funis is inserted at the margin, instead of centrally.
2. The vessels of the cord may not unite, even at the margin, but ramify over the membranes before uniting to form the funis; known as the *velamentous* insertion of the cord.
3. The subdivision may extend even to the placenta, and result in there being two or more placentæ, situated at different points on the uterine walls; called *placentæ succenturiæ*.

These anomalies are uncommon, but sometimes lead to perplexities in the delivery of the after-birth.

INVERSION OF THE UTERUS.

What is inversion of the uterus?

A turning inside out of the womb, so that the fundus—

1. May present at the os uteri (partial inversion), or—
2. Passes through the os and extends to or through the vulva (complete inversion).

What is the cause of inversion?

Partial and irregular contraction of the uterus is the main factor, often aided by traction upon the cord in delivering the placenta. No one can invert a healthy womb by traction upon the cord, but if the fibres under the placental site are not contracting, inversion will be very likely to occur. It may happen either before or after the placenta is detached.

How may inversion be recognized?

1. The woman usually complains of great pain at the moment of the accident (a sensation as of something tearing loose within her). 2. Hemorrhage and more or less shock follow. 3. The hand, placed upon the abdomen, fails to find the womb in its natural place, and when introduced within the vagina finds it there (unless external). It can then be mistaken for nothing but a fibroid tumor, which, of course, could not occupy the vagina just after delivery.

How is inversion to be treated?

1. The placenta, if adherent, is to be detached.
2. The womb should then be squeezed within the hand, to reduce its bulk, and attempts made to replace the fundus, with the hand grasping it, while the other hand presses downward in the hypogastric region, making counter-pressure.
3. If this fails, endeavor to indent the uterine globe with a knuckle or the finger tips and thus reinvert it. The indentation is said to be best effected at the opening of a Fallopian tube. Pressure should be firmly and patiently continued, and if employed just after the accident, rarely fails.
4. After the fundus is replaced the hand should remain within the uterus for some time, or until expelled.

What is to be done in case of failure?

If called too late, or if replacement cannot be effected without violence, the fundus should be bathed with somewhat diluted tincture of iodine, to restrain hemorrhage, and allowed to remain inverted for one or two months, or until involution has taken place, when the reposition may be attempted by the method of White.

What is emphysema of the neck?

During the bearing-down efforts of the second stage it sometimes happens that a few air vesicles in the lungs are ruptured, and air escapes by way of the mediastinal space to the cellular tissues of the neck and face. It is usually limited to one side, the tissues being swollen and crackling under the fingers. It may cause great alarm, but is innocuous if left alone, subsiding in a few days without any ill consequences.

What ill consequences attend laceration of the mother's tissues?

The only immediate consequence is or may be hemorrhage, easily controlled.

The remote consequences may be serious, especially when the perineum or cervix are badly torn.

What is to be done when the cervix is lacerated?

Some authorities recommend that sutures should at once be inserted; but the general practice is to let it alone until the womb has passed through the period of involution of the womb.

What is to be done when the perineum is lacerated?

Most authorities recommend that it should at once be united with sutures, unless of very slight extent.

OBSTETRIC OPERATIONS.

What are the capital operations of midwifery?

1. The use of the forceps. 2. Version. 3. Embryotomy in various forms. 4. The Cæsarean section and modifications. 5. The induction of premature labor.

What are the obstetric forceps?

Two separate and similar pieces of steel, each fashioned into a blade and handle, intended to cross each other in the middle and be temporarily united at that point by a lock.

What is the object of the forceps?

1. They are used to seize the child's head and to make *traction* upon it.
2. They are used to aid the *rotation* of the head.
3. They are used to *flex* or extend the head, as may be required.

Why is a fenestra or open space made in the blades?

To allow the parietal protuberances to project, thereby permitting the forceps to be applied to the head without at all adding to its bulk.

What curves exist in the blades?

1. The *pelvic* curve, so that they can be applied at any point in the pelvic canal with equal ease.
2. The head (or *capital*) curve, by which they are bowed outwardly, so as to enable them to grasp and hold the head.

How many forms of lock are in common use?

The mortise, or English lock; the pivot, or French lock, and the button or German lock.

How are the blades distinguished and named?

The blade to the left is called the left blade, or when provided with the pivot or button, the *male* blade (see Fig. 15).

The blade to the right is called the right blade, or when provided with a slot, the *female* blade.

When should the forceps be applied?

In any case where the head presents, and where *prompt delivery* is necessary (either for mother or child), or to be regarded as preferable to waiting upon the natural efforts.

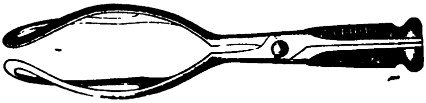
May they be applied during the first stage?

There are few circumstances which warrant us in applying them before full dilatation of the os. The necessity for prompt delivery should be very clear, since bruising and laceration of the cervical tissues are almost inevitable.

What preliminaries are requisite to their application?

The consent of the woman being obtained, she should be placed in a suitable position and the forceps be placed in warm water.

FIG. 15.



DAVIS FORCEPS—UPPER VIEW.

In what position should the woman be placed?

Lying crosswise in the bed, the vulva overhanging the bed's edge, and with her feet placed upon two chairs. The knees may be held apart by an assistant, and the legs covered.

What station should the physician occupy?

Seated upon a chair, directly in front of the vulva, the forceps placed within reach.

How should the forceps be applied to the L. O. A. position at the inlet?

1. The physician should take the male blade in his left hand, holding the handle securely, and having greased both the blade and his right hand, pass the latter into the vagina, high enough to enable him to feel the rim of the os uteri (on the left side of the mother). Two fingers will often suffice, instead of the whole hand.

2. Pass the blade along the palmar surface of the right hand or fingers, aiming to place the blade under the left sacro-iliac arch, and, therefore, along the left side of the child's head. This is usually very easy, as there is a free space at that point. Care should be taken to pass it between the cervix and head.
3. When the first blade has been adjusted to the head, its handle should be pressed well against the perineum, so as to keep it out of the way.
4. The right hand is now cleansed and takes up the female blade, which, with the left hand, is anointed, and the fingers of the latter passed into the vagina, to guard the rim of the os uteri.
5. The female blade is then introduced upon the palmar aspect of the fingers, with the view of insinuating it between the child's head and the pelvic walls, behind the obturator foramen, and, therefore, upon the right side of the head.
6. When the second blade is fully introduced, it should lie upon the first blade, with the slot just opposite the pivot, and the handles being now compressed, the instrument is locked and fully applied.

How should the first blade be held at the beginning of introduction?

As the tip of the blade enters the vulva, the handle should be held nearly perpendicular, with the tip above the inner limit of the right groin. The rest of the introduction resembles the passage of the catheter in the male.

How should the second blade be held at the beginning of its introduction?

As the tip of the blade enters the vulva, the handle should lie in the line of and almost touching the left groin. The handle is then brought almost directly to the median line, and the blade pushed onward and upward, as soon as the handle is free from the left leg.

What should be done if the instrument cannot be locked?

The second blade should be withdrawn, and more carefully reapplied. Locking can often be effected by simply pushing the handles well back upon the perineum.

How should the forceps be held in making traction?

The handles should be grasped with the right hand, and gently compressed; the left hand should be placed over the lock, with a finger upon the top of each blade.

How is traction to be made?

1. The left hand presses or pushes the blades downward and backward (and slightly to the right), while the right hand pulls the handles partly in the reverse direction and partly in the line of the handles.
2. As the head descends, the direction of traction is changed, being made in the curve of the obstetric canal at all times.

How long should traction be made?

For about a minute at a time, with an interval of the same or greater length, during which the handles should be partly unlocked, to remove the compression of the forceps from the child's head.

Should traction be made during a labor pain?

The contractions may be disregarded until the head presses upon the perineum, when traction should be made only in the absence of uterine contractions, and if the operator is not sure of his skill, he should withdraw the forceps at this point.

How may the forceps be withdrawn?

By reversing the motion used in applying them, and with the same deliberate ease.

How are the forceps applied at the inferior strait?

The head having rotated, the blades will be on opposite sides of the pelvis, when on the sides of the head. Therefore, both blades are passed in the same manner, and nearly as the first blade is passed in the high operation.

How are the forceps to be applied to an R. O. P. position at the inlet?

Precisely as in the L. O. A. position.

How is traction to be made in the R. O. P. position?

1. The handles should be grasped firmly, so as to hold the head securely while,
2. The handles are elevated, with scarcely any traction, so as to *flex the head;* this being a necessary part of the natural mechanism.
3. Traction should then be made in the axis of the canal, and with as *little compression* as possible, in order not to interfere with rotation.
4. If the twisting of the handles shows a tendency to rotate, this may be aided; but rotation should not be forced.

How are the forceps to be applied in the R. O. A, and L. O. P. positions?

The position of the head being the reverse of the L. O. A. and R. O. P.

positions, the right side of the head is behind and at a distance, the left side in front, and near. Therefore, the female blade is first applied, under the right sacro-iliac arch, and in the same way as the first blade in the other position. The male blade is then introduced in a manner corresponding to the second blade, in the L. O. A.

What difficulty is then encountered?

The shank of the male blade will lie *over* the female blade, and the instrument cannot be locked.

How is this to be remedied?

Take hold of the handles separately, and bring each handle to the median line and beyond, until the handle of the female blade can be lifted over that of the male blade. They will then be in position for locking.

How are the forceps to be applied on the face presentation?

In the first and third positions, precisely as in the vertex, first and third. In the second and fourth positions, precisely as in the vertex second and fourth.

May the forceps be used on any part but the head?

They have been used upon the breech, but are of doubtful utility as compared with other procedures, and not free from danger when so applied. The objections do not, however, apply to the *axis traction* forceps.

What are the indications for the use of the forceps?

1. For *delay* in the second stage of labor, arising from (*a*) uterine inertia; (*b*) any obstruction or disproportion.
2. For delay in the first stage, rarely, as in (*a*) placenta previa; (*b*) organic rigidity; (*c*) absence of natural dilating agent.
3. For rapid delivery, when required, by such complications as, (*a*) convulsions; (*b*) prolapse of the funis; (*c*) excessive uterine action menacing rupture.
4. For secondary purposes, as for (*a*) extraction of the child in the Cæsarean section; (*b*) after rupture of the uterus; (*c*) for removal of tumors or foreign bodies from the maternal passages.

What is the principal circumstance demanding their use?

Uterine inertia, or insufficiency of the uterine contractions to complete the labor.

How long should the second stage be allowed to continue before resorting to the forceps?

Rarely over one or two hours. It is irrational to subject the woman to long continued pain and effort, when we can harmlessly deliver by art.

What alternatives do we posses to the use of the forceps?

Version and embryotomy—

1. If prompt delivery is indicated in any case, and we do not possess the forceps or the skill to use them, we may employ version.
2. If the forceps fail to extract the child, or the pelvis is so deformed as to render their use impracticable, we may perform version (according to some authorities), or resort to embryotomy.
3. The last generation of physicians used a substitute, the *vectis*, which is simply a single blade of the forceps. It was used to slip over the head to flex it, or by alternately pressing on one side and the other to make traction. It can do nothing which cannot be better done by the forceps.

VERSION.

What is version?

The operation by which the *presentation* of the child is changed; called, also, turning.

How many kinds of version are there?

1. As regards the *choice* of presentation there are two—

(*a*) *cephalic*, in which the head is made to present, and,

(*b*) *podalic*, in which the breech is made to present.

2. As regards the *mode* by which it is effected, we have three—

(*a*) *internal*, in which the hand is passed into the womb to effect the change,

(*b*) *external*, in which the change is effected by manipulation through the abdominal walls only, and

(*c*) *bipolar*, in which one hand upon the abdomen and two fingers (or more) internally are used.

What are the indications for version?

1. To convert a transverse presentation into one of the vertex or breech.
2. When rapid delivery is required, and the use of the forceps is not feasible, podalic version is indicated.
3. According to some authorities, to render delivery easier in deformed pelvis.

How is internal version performed?

1. The hand is cautiously passed into the uterus until a foot is reached and seized. As this foot is pulled down the child is turned until the breech presents. According to some, version will be easier if we seize the foot which is furthest from us. 2. The head may be seized and brought down in some cases.

What cautions are necessary?

1. To introduce the hand slowly and gently, lest the womb be lacerated. Anæsthesia is sometimes of service in promoting uterine relaxation.
2. Not to mistake a hand for a foot.

What posture assists in version?

When a transverse presentation is impacted the woman may be placed in the knee-chest posture, which will aid in introducing the hand.

How is external version performed?

1. By careful palpation we ascertain the exact position of the head and breech.
2. One hand placed over the head (on the abdomen) and the other over the breech, push the head and breech in opposite directions until one or the other is brought into the pelvic inlet.

This is rarely practicable after the liquor amnii is evacuated.

How is bipolar version effected?

1. One hand is introduced into the *vagina*, and two fingers made to press against the presenting part.
2. The other hand is applied on the abdomen and pressed against the head or breech of the child, while the fingers of the other hand press the presenting part upward and to one side or the other.

This method should always be tried before internal version is resorted to, since, if successful, it removes the necessity of introducing the hand into the womb.

Under what circumstances is version easy or difficult?

1. When there is much liquor amnii, and the uterus is uncontracted, it is easy of performance.
2. When the liquor amnii has drained away for some hours, when the womb is tonically or tetanically contracted, and when the child has been dead long enough for post-mortem rigidity to supervene, it is difficult, and sometimes impossible.

When version fails in a transverse presentation, what alternative operation have we?

Embryotomy.

EMBRYOTOMY.

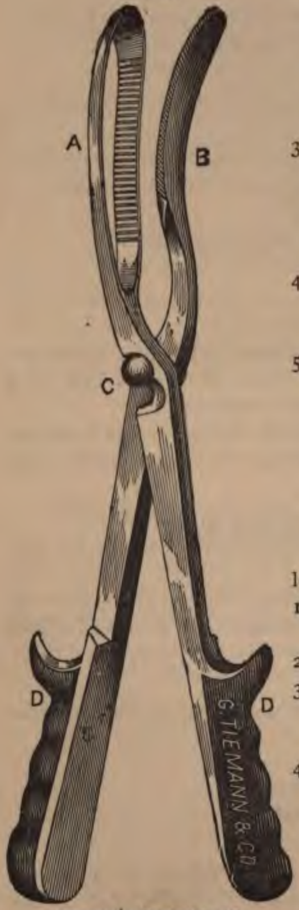
What is embryotomy?

The operation by which the size of the child is reduced by cutting and mutilation. It is now restricted to mutilation of the body; when applied to the head it is called craniotomy.

What are the steps in performing embryotomy on the transverse presentation?

1. An assistant places his hands on the abdomen and presses the child downward, so as to steady it.

Fig. 16.



SIMPSON'S CRANIOCLAST.

2. A perforator is introduced into the vagina, and made to perforate the chest, and to divide several ribs. Care should be taken to guard the sharp edges of the perforator with two fingers, while introducing and using it.
3. A blunt hook, crotchet or other instrument, is introduced into the chest through the perforation, and the viscera broken up and removed piecemeal. This is called evisceration.
4. The body may then be doubled up and drawn down by a blunt hook or embryotomy forceps.
5. In a few cases it is necessary to decapitate the child before it can be extracted. This may be done by instruments invented for the purpose, or by improvised methods, if the operator is ingenious.

What is craniotomy?

The operation by which the head is lesssened in size.

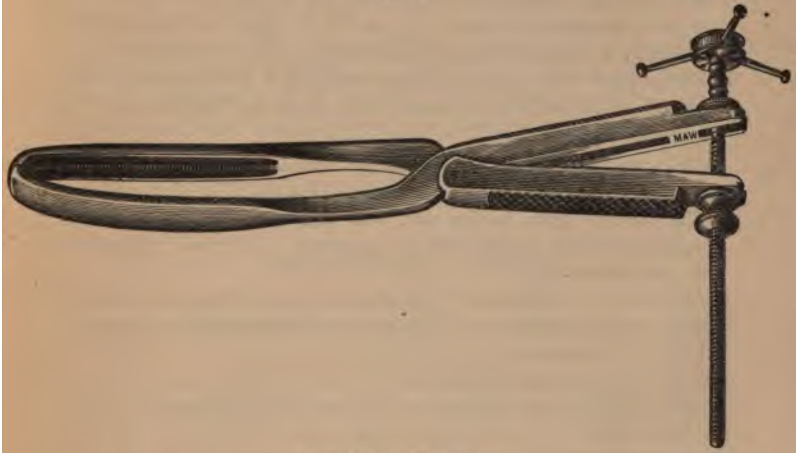
1. The head is pressed down and steadied by an assistant.
2. The head is perforated.
3. The brain is broken up completely, and if necessary removed by syringing out the cranial cavity.
4. Traction is made upon the head by a finger hooked into the perforation, by craniotomy forceps, or by any suitable instrument, and the head collapses, and is drawn out. If not sufficiently reduced in size by these steps, we proceed to cranioclasm.

What is cranioclasm ?

The operation by which the vault of the cranium is removed.

1. Craniotomy is performed as above.
2. With the cranioclast (or craniotomy forceps) seize an edge of bone at the perforation, and wrench off as large a piece as possible, which is then cautiously withdrawn. This is repeated until the vault of the cranium is removed.
3. The head is then tilted, so that the craniotomy forceps can seize the face, and the thin base of the skull is drawn down through the pelvis.

FIG. 17.



HICKS' CEPHALOTRIBE.

What cautions are necessary ?

1. To preserve the scalp, so that the sharp edges of bone may be covered while it is withdrawn. Therefore, the scalp is to be dissected up before using the cranioclast, and its blades placed, one inside the skull, and the other between the scalp and outside of the skull.
2. To guard the edges of fragments of bone with two fingers while withdrawing them.

If even the base of the skull is too large to pass, what alternative have we ?

Cephalotripsy, in which a powerful pair of forceps (the cephalotribe) is applied, and made to crush the base. Cephalotripsy may also be used before resorting to cranioclasm, but perforation of the cranium should always precede the application of the cephalotribe.

CÆSAREAN SECTION.

What is the Cæsarean section?

Gastro-hysterotomy, or the removal of the child through an incision made in the abdominal walls and uterus. It is sometimes incorrectly applied to simple gastrotomy (laparotomy) after rupture of the uterus.

What are the indications for the Cæsarean section?

1. A pelvis contracted to two inches in the conjugate, or obstructed by tumors, or other insurmountable obstacles to delivery by the natural way.
2. For the rapid delivery of a supposed living child after the death of the mother. Children have been saved when the mother had been dead for more than an hour.

What are the steps in the Cæsarean section?

1. The woman is prepared by anæsthesia and the emptying of the bladder.
2. The operator stands by her side, with his face toward her feet, and begins to make his incision near the symphysis. (To avoid cutting early into the placental site.)
3. An incision is made, layer by layer, in the linea alba, from near the pubes to the umbilicus, and, if necessary, continued further up, and to the left of the navel.
4. The womb is cautiously incised.
5. The child's feet are grasped, or the head seized by forceps, and the child extracted.
9. The after-birth is delivered.
7. The uterine incision is closed by a few sutures.
8. The abdominal cavity is carefully cleansed of all blood and fluids.
9. The abdominal incision is closed by suture.
10. The operation and subsequent treatment should be conducted with strict antiseptic precautions.

What is Porro's method?

A modification of the Cæsarean section, in which the uterus is removed after the child is delivered, and the stump treated as in ovariotomy.

What is gastro-elytrotomy?

A modification of the Cæsarean section, in which the vagina is opened instead of the uterus, thus escaping the risks of opening the abdomen.

1. An incision is made parallel to and just above Poupart's ligament.
2. When the peritoneum is reached it is dissected up until the fingers reach the upper end of the vagina.
3. A small incision is made into the vagina, and enlarged by tearing with the fingers (to prevent hemorrhage).
4. The os uteri is hooked into this incision.
5. The child is turned, or the forceps applied, and extracted through this opening.
6. The upper wound is closed by suture.

It is difficult to avoid injuring the bladder, and the entire operation demands great skill.

What is symphyseotomy?

The section of the symphysis pubis, for the purpose of pulling open the ossa innominata and enlarging the pelvic cavity. It is called also the Sigaultian operation, after its inventor (1777). The operation was thoroughly tested when first introduced, and abandoned because it did not materially increase the effective diameters and did inflict injury, sometimes irreparable, upon the mother. Its recent attempted revival is due to a craving for notoriety.

INDUCTION OF LABOR.

What is the induction of premature labor?

The operation by which labor is brought on at any time before full term.

What are the indications for its performance?

1. In deformed pelves, a child may be delivered alive if labor is induced at seven or eight months of pregnancy, which would have to be sacrificed by craniotomy if allowed to develop until full term.
2. If the mother's life is endangered by vomiting, convulsions, or other causes, the operation is sometimes performed.

How is the operation conducted?

(Barnes' method.) 1. Pass an elastic bougie six or seven inches into the uterus; coil up the remainder of the instrument in the vagina, to keep it in place. Do this in the evening.
2. Next morning proceed to dilate the cervix by Barnes' (or Molesworth's) dilators, until it will admit several fingers.
3. Rupture the membranes and reapply the dilator.
4. Allow the natural efforts to complete delivery, or use the forceps or version.
5. (Thomas'.) Pack the child in cotton or wool as soon as born, and maintain a suitable temperature by artificial heat, applied in various ways.

THE PERIOD AFTER DELIVERY.

What is the period after delivery called?

The *lying-in* period, the puerperal state, or the period of involution, because after labor the uterus undergoes the process of involution.

What is involution?

The process by which the womb returns to its original size and condition. The tissues of the womb undergo a form of fatty degeneration. As the products of this change are partly absorbed and partly transuded and discharged from the body, the structure of the uterus becomes condensed until it has become nearly of the same size and condition as before pregnancy. The same change takes place in all the structures (ligaments, etc.) enlarged by pregnancy.

How long a time is required for this process?

By the tenth day the womb is so diminished as to be entirely within the pelvis, and the fundus is not to be felt above the inlet. After this, involution continues at a slower rate, being completed in about twelve weeks.

What irregularities are met with?

1. *Sub-involution;* it may be protracted by inflammation or other concurrent disease, and remain enlarged permanently, or for a long time.
2. *Super-involution;* it may be rapid and excessive, leading to atrophy of the womb; but this is very rare.

What outward or clinical manifestation of involution exists?

The lochia (plural), or lochial flow; or, popularly, the flow, or cleansings.

What are the lochia?

The "flow" is the discharge from the uterus and vagina which occurs after labor, and, to some extent, until the womb is completely involuted.

What are its properties?

It is a rather thick albuminous fluid, containing oil globules, epithelial cells, blood corpuscles, and granular débris from the uterus. During the first day after labor it is of a *red* color, from the presence of blood in excess (or it may be blood alone immediately after labor). This may continue for several days, especially if any clots have been retained in the uterus, after which it becomes straw-colored, and finally clear and colorless.

What is the nature of the lochial fluid?

It is an excrementitious product, and readily decomposes at the temperature of the body or a little higher. If retained and reabsorbed it may poison the blood, as any other excrement, thus causing septicæmia.

What is the amount of the lochia?

At first varies from one-half ounce to several ounces per diem. It is gradually diminished, and after the tenth day is usually scarcely perceptible being little more than the natural secretion of the parts. In some women it is very scanty and ceases after a few hours or a day or two, while in others it may continue for weeks.

What is the normal condition as to health after labor?

The majority of women feel in good health, being only a little tired and sore, and in a few days feel competent to arise and resume their avocations.

Should they be permitted to do so?

No. Rest and quiet are essential, to guard against the dangers incident to this period.

How long should the woman be kept in bed and at rest?

Until the womb has retreated within the pelvis, and not allowed to work until involution is complete. Before this, the womb is enlarged and softened, and is subject to displacements and flexions.

What physical peculiarities are noted in this period?

1. The pulse becomes slow, falling to 60 beats per minute, or less.
2. The temperature is elevated from .5° to 1° Fahr.
3. The skin is more active and perspiration more free.
4. The urine is increased in amount.
5. The bowels are constipated.
6. The breasts secrete milk.

How soon after labor is milk secreted?

To a slight extent during pregnancy, and some is to be found in the breasts just after labor. But the secretion is not fully established for from thirty-six to seventy-two hours, beginning suddenly in some and gradually in others.

What is the nature of milk?

It is an emulsion of oil globules in an albuminous fluid, containing salts in solution. When of good quality it is rather thick (a drop adhering to the finger nail when inverted), of a bluish tinge and sweetish taste. The milk found in the breasts just after labor differs from the subsequent secretion, in being richer in fatty matters and slightly purgative to the child. It is called colostrum.

What is weid, or milk fever?

An irritative fever, lasting from several hours to one or two days, and occurring in women in whom the secretion of milk is suddenly established.

It is due to reflex irritation, from the sudden development of secretory changes in the breasts. Clinically, it is distinguished by a sudden rise in temperature. preceded by a slight rigor and followed by free diaphoresis, and cannot be distinguished from an attack of intermittent fever, except by its non-recurrence.

What rules should be observed concerning lactation?

1. During the first month the baby should nurse REGULARLY, every two hours during the day and once or twice at night; during the next month the intervals may be lengthened to three hours, and afterward to four hours. Observance of this rule will save much trouble.
2. The nipple should be clean, drawn out and erect, when offered to the child, especially at first.
3. After nursing, the nipple should be washed, dried and anointed with cocoa butter, or other unguent.
4. If the breasts are large and pendulous they should be supported by a bandage whenever the woman is in the upright posture.

What attention does the urine require after labor?

Retention is apt to occur after long labors, from temporary paralysis of the bladder and urethra, from pressure. The catheter should then be passed, within twelve to twenty-four hours after labor, and, if necessary, twice daily, thereafter, until recovery. Hot cloths are also useful when the retention is due to local swelling and spasm.

How should the catheter be passed in the female?

1. Place the woman on her back, with the knees drawn up.
2. Introduce the finger into the vagina, passing it from below, upward, over the perineum and posterior commissure into the vulva.
3. Partially withdraw the finger, pressing slightly on the anterior wall until its tip arrives at the orifice of the vagina.
4. With the other hand pass the catheter along the finger to the tip, immediately above which is the meatus.

If this fails, the meatus must be sought for by the tip of the finger, which is to be depressed as soon as the catheter arrives at the vestibule.

Do not try to pass the catheter by the sense of touch alone, if not promptly successful, but remove the bed clothes, and *look* for the meatus.

What attentions do the bowels require after labor?

Owing to the constipation, it is usually necessary to give a purgative on the third or fourth day after labor. This will not be needed if the bowels move spontaneously, and if there seems to be a slight inclination to a movement, an enema will be preferable.

What rectal difficulty is common at this time?

Hemorrhoids. These should be carefully replaced if extruded, after labor, and during convalescence an attempt may be made to cure them by medication (Barker's pills).

What diseases are especially liable to occur in this period?

The lying-in woman is liable to septicæmia, peritonitis, and pelvic inflammations, thrombosis, phlebitis, pyæmia, and mastitis.

What is puerperal septicæmia?

1. A fever produced by the absorption of septic matter into the system (Playfair).
2. It may occur in a severe and acute form, or in a mild and subacute form.
3. It is often associated with inflammations, by which its course is greatly modified.
4. The various conditions resulting from the union of septicæmia and inflammations are grouped by some under the name of puerperal fever.

What are the causes of septicæmia?

1. Puerperal septicæmia is believed to be due to a specific microbe, which enters the body through a traumatic surface.
2. The poison is contagious, and, under favorable circumstances, multiplies with great rapidity in the body.
3. It is heterogenetic, never autogenetic, and may be conveyed to the abraded surface either by
    - (*a*) the atmosphere,
    - (*b*) towels or sponges which have been used in other cases, or to cleanse suppurating wounds, and have not been antisepticized,
    - (*c*) the doctor or nurse, who has been attending patients with septicæmia, suppurating wounds, erysipelas, diphtheria, or other zymotic diseases.
4. The poison can only enter through an abraded surface.
5. The retention and decomposition of fragments of the placenta or membranes, clots in the uterus or retained lochia, will not produce the disease, but will favor its development by forming a suitable nidus for the micro-organisms on which the disease depends.

What are the symptoms and course of acute septicæmia?

1. Slight chilliness; no rigor, unless complicated by inflammation.
2. High fever, usually developed rapidly. { Temperature 103° to 109° F. Pulse 120 to 150.
3. No pain or slight tenderness in hypogastrium.

4. Suppression of the lochia or a fetid discharge in some cases.
5. Mind usually unimpaired, and the patient either cheerful or indifferent.
6. Face anxious.
7. The typhoid state usually precedes a fatal termination, which occurs within a week, unless recovery takes place.

What are the symptoms of chronic septicæmia?

1. The patient remains weak, and has little appetite.
2. The tongue is pale and flabby, and lightly coated, if at all.
3. Slight fever, of intermittent type, is present.
4. The urine is high-colored, and constipation exists.

How is septicæmia influenced by peritonitis and other inflammations?

1. The symptoms of peritonitis, and other inflammations (metritis, cellulitis, etc.), are but little different in the puerperal period and at other times, and in all, except peritonitis, a mere mixture of symptoms is present when occurring with septicæmia.
2. In peritonitis with septicæmia, the septic symptoms predominate, and a remarkable difference between the pulse and temperature rate is observed.

The pulse is frequent, 120 to 150, while the temperature is *slightly* elevated, or even *subnormal.*

The abdomen is tympanitic, yet the patient complains little of pain.

What are the indications for treatment in acute septicæmia?

1. Antiseptic injections. These should be made into the uterus, and any retained fragments of placenta, etc., removed.
2. Whiskey administered with a free hand.
3. The salicylate of soda or potassa, and quinine, are also useful in full doses.

How are antiseptic injections to be given?

1. The material to be injected may be (*a*) a two per cent. solution of carbolic acid; (*b*) tinct. iodine one-fourth, to water three-fourths; (*c*) corrosive sublimate one part to 1000 or 2000 of water. Each of these has its advocates, and there are others less used.
2. A tube attached to a syringe is to be carried into the uterus. (A flexible catheter without its stylet will do very well.)
3. The fluid is then to be injected without force, and care taken that the os uteri is kept open, so that fluid can get out as rapidly as it gets in.
4. Continue the stream until it comes away clear.

5. Use every few hours, or often enough to keep the uterus free from putrescible matters.

What are the indications for treatment in chronic septicæmia?

1. Antiseptic injections, if there is any reason to suspect the retention of putrescible materials in the uterus.
2. To improve the action of the excretory apparatus by such agents as calomel, ipecac, and saline laxatives.
3. The salicylates or quinine, in small doses.

What are the indications for treatment in inflammations, complicated with septicæmia?

The septicæmia is to be regarded as the chief trouble, and the inflammation combated as a secondary matter.

What is uterine thrombosis?

The formation of clots in the uterine sinuses, due to imperfect contraction of the womb after delivery.

What results may follow from thrombosis?

1. Detachment of fragments, and formation of emboli in other structures, as in the lungs, brains, etc., leading to inflammations in the obstructed organs and metastatic abscesses.
2. Purulent liquefaction of the thrombus and subsequent escape of pus into the circulation, causing pyæmia.
3. Extension of the thrombus into consecutive veins, causing phlebitis.

What is phlegmasia alba dolens?

Also called "milk leg," is an inflammation of the cellular tissue of the thigh and leg, usually associated with femoral or crural phlebitis. Thrombosis of the vein may precede or coexist, but is not always present.

What are the symptoms of "milk-leg"?

It begins usually in the second week with—

1. Irregular chilliness and malaise for several days.
2. Pain in the leg and abdomen, of a dragging character.
3. A distinct rigor, and swelling of the leg.
4. Fever of a remittent type, changing to intermittent as recovery advances, or becoming continuous in grave cases.

What peculiarities attend the swelling?

1. The skin is white and tense.
2. A red streak marks the line of the vein when phlebitis is present.
3. Later, the vein feels like a hard cord when palpated.

What are the results of "milk leg"?

1. It may end in complete resolution.
2. An abscess is formed along the vein, and discharges.
3. Gangrene and septicæmia may be developed.
4. If thrombosis is present, emboli and pyæmia may occur.

In all cases recovery is slow, and the leg is apt to remain weak and become œdematous, from permanent obstruction of the vein.

What is the treatment indicated in "milk leg"?

1. To control inflammation.
2. To relieve pain.
3. To support the patient's strength.

The first can be best effected by the use of atropia, in a one per cent. solution, applied to the parts with a cloth, or by belladonna ointment. Warm fomentations are also useful, and a lotion of lead water and laudanum, applied warm, is also useful in relieving pain. Anodynes may be given as needed. Absolute rest is essential. If an abscess forms it may be evacuated, and applications of tinct. iodinii are useful in promoting resolution.

What is mastitis?

Inflammation of the breast. It is divided into: 1. Glandular; 2. Interstitial, and 3. Sub-glandular. In the first the lobules of the gland are inflamed. In the second the connective tissue is inflamed. In the third the connective tissue beneath the gland is involved.

What are the symptoms of mastitis?

1. In interstitial and sub-glandular mastitis the symptoms are those of abscess in the cellular tissue anywhere; slight constitutional disturbance, except in large sub-glandular abscess, and the pain is *not increased* by suckling the child.
2. In glandular mastitis there is a rigor and high fever, preceded by a hard lump in the breast, and suckling causes severe pain.

What is the treatment of mastitis?

1. When the connective tissue is involved suppuration is almost inevitable, and is to be treated on general surgical principles, poultices, early incision and antiseptic treatment being usually indicated.
2. In glandular mastitis various measures have been employed; massage or stroking, rubbing and kneading the breast; endeavoring to empty engorged milk sinuses, and to remedy the blood stasis. An ice-bag is strongly recommended; also compression by strapping with adhesive

plaster, or with a plaster-of-Paris dressing. To directly affect the blood supply and functional activity of the gland, belladonna is used, internally and externally. The sulphide of calcium internally, and iodide of lead externally, are used, and many other remedies have advocates.

In all cases the breast should be suspended in a sling. When incisions are necessary they should be made in a line radiating from the nipple, to avoid severing milk ducts, the abscess cavity should be washed out thoroughly with an antiseptic solution and dressed antiseptically, and quinine should be given with a good diet, and stimulants if necessary.

What are the chief causes of mastitis?

Cold, obstruction of milk ducts, septicæmia and sore nipples.

What affections of the nipple are met with?

The nipples may be simply tender, or inflamed, with resulting abrasions, excoriations and fissures. The inflammation may be simple, aphthous or eczematous.

How are sore nipples to be treated?

1. Stop suckling, and have the milk removed by a pump or massage.
2. Apply astringent remedies, or such as act by excluding the air. The best applications are tannin and glycerine, compound tincture of benzoin, collodion; but all treatment will be uncertain if the child is allowed to nurse while the nipple is sore.

What are agalactia and galactorrhœa?

1. Agalactia is a suppression or greatly diminished flow of milk. The secretion of milk may be augmented by free use of fluids, especially milk, and by persisting in applying the child to the breast. Attention to the general health is important.
2. Galactorrhœa is an excessive secretion of milk. This may be remedied by the use of coffee and belladonna, and by a diet consisting of very little liquid and more solid food. The name is sometimes used to denote incontinence of milk from want of muscular tone in the nipples. This is to be treated with astringents.

What are the principal congenital defects in the child which require attention?

Hare-lip; imperforate anus or urethra; spina bifida; club-foot; cephalhæmatoma; patulous foramen ovale.

What general rules are applicable to these affections?

1. Hare-lip is to be operated on at once, if it interferes with suckling; otherwise we may wait a few months, until the child is stronger.

2. Imperforate anus and urethra are to be operated on at once.
3. The treatment of other malformations should be begun as soon as practicable.

What is a cephalhæmatoma ?

A swelling upon the parietal bone, consisting of blood effused under the periosteum. It begins usually within an hour or so after birth, and is important only in that it may be confounded with a caput succedaneum.

How is the diagnosis made ?

In cephalhæmatoma the swelling never extends beyond the edges of the parietal bone. Aspiration will show that the contents consist of blood, which is very finely clotted, and which remains fluid. The cephalhæmatoma becomes larger as the effusion dissects up the periosteum, and the edges are sharply defined, giving the impression that the skull is fractured.

What treatment is indicated ?

It does best when left alone; if the swelling is great, an incision may be necessary, to relieve tension. The only danger is from irritation of the scalp and erysipelatous inflammation. It generally disappears after four or five weeks.

What is a patulous foramen ovale ?

A failure of the foramen in the auricular septum to close after birth. Hence the blood is diverted from the lungs. The child is subject to spells of partial asphyxia (rarely continuous) and the face becomes dusky or livid; hence the name a "blue child."

What is to be done ?

Treatment by posture; the child is to be kept on its *right* side, that the action of gravitation may hinder the escape of the blood through the foramen.

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